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THE IMPORTANCE OF THE UPPER RESPIRATORY TRACT IN THE ETIOLOGY OF CRYPTOGENETIC INFECTIONS, ESPECIALLY IN RELATION TO PLEURITIS.

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The work which is outlined in this paper was undertaken with the purpose of determining whether there could be any direct relation between lesions in the upper respiratory tract and plural infections. During the last few years several articles have appeared, pro and con, as to the possibility of a direct lymphatic connection between the throat and the bronchial glands as well as the pleural apices, but a great deal more thought and work have been directed toward the importance of the throat as being the starting-point for general hematogenous infection. These two questions are, however, closely associated, for if the invading germ has penetrated along the lymph-paths as far as the pleura, it would seem that occasionally an entrance into the blood might very easily be accom-

plished. And, on the other hand, if the pleura should be, at the time of the infection, the place of least resistance, bacteria which have entered the blood may lodge and grow at this spot. Yet, while there is more or less connection between the hematogenous and lymphatic routes, there may be a radical difference in their reception which is of great importance. Boeri has shown that while toxins pass through blood-vessel walls very easily, it is almost impossible for bacteria to do so, although they readily penetrate along the lymph-channels. If the infection is hematogenous in the start, it must be simply a septicemia due to the absorbing of toxins from an infecting focus, in which case only the toxins leave the original local process and not bacteria. If the lymph-channels are the route of invasion, then it is very possible for micro-organisms themselves to be carried from their original seat, and after successfully overcoming the various lymph-glands in their way, finally give rise to a true bacteremia. Therefore, in regard to the influence of lesions of the upper respiratory tract on pleural conditions we must recognize that there are two routes of attack from the throat.

For an infection to start there must be some portion of the throat which may act as a gate of entrance, some place of insufficient resistance which may either become an infecting nidus or act as an entrance. As lymphatic tissue is the tissue par excellence for the propagation of infections, it is natural that one should suspect the tonsils of showing lessened resistance.

By the tonsils I do not mean the faucial tonsils alone, but also the pharyngeal and lingual tonsils, the lymphoid tissue of the lateral folds of the pharynx, and the lymph-follicles of the posterior pharyngeal wall. However, as the faucial tonsils would generally represent by far the greater amount of lymphoid tissue in the throat, these structures are much more open to investigation, and hence the greater part of the work that will be outlined in this paper pertains especially to them.

The opposition to the entrance of bacteria into the body from any surface depends upon the vital resistance of the tissues, and also upon the mechanical barrier presented by the lining membrane. The epithelium lining the upper respiratory tract is either a stratified squamous variety, as exemplified in the mouth, or a stratified ciliated columnar type, as found in the nose. The surface of the faucial tonsils is covered by stratified squamous cells. The structure of a tonsil resembles

somewhat that of a lymph-gland, differing, however, in that it possesses no afferent lymph-vessels and no periglandular sinuses, and does possess those peculiar structures, the crypts or lacunae.

The crypt of the tonsil is its peculiar and most characteristic structure. It consists of an invagination of the epithelium from the surface of the tonsil, which has undergone a very interesting anatomical change. In the first place, the subepithelial connective tissue which exists in a marked degree beneath the surface epithelium, disappears as soon as the epithelium starts to form the crypts. This permits the epithelium to come in direct contact with the lymphatic structure of the tonsil, and very frequenly it is impossible to distinguish a dividing line between the epithelium of the crypt and the interfollicular tissue. The epithelium of the crypt, unlike its progenitor which covers the surface of the tonsil, does not form a compact, unbroken barrier of protection. For the greater part of its extent it presents an intact line, only one or two or probably three cells in thickness, and there are occasional spaces between these cells. Toward the parenchyma the epithelial cells show a peculiar condition. They are separated from each other by interposed cells varying in type from slightly changed epithelial cells to well-formed lymphocytes. The epithelial cells may also extend from the crypt into the tonsillar substance, suggesting the ramifications of a malignant epithelioma. The smaller terminal invaginations of the cryptal epithelium are usually solid sprouts, sometimes, however, with central keratosed cores, the exfoliation of which causes an extension of the lumen of the crypt.

In the crypt, then, we have a loose, disintegrated epithelium which, as far as any mechanical barrier is concerned presents an open door to microbic infection, and it has been shown that minute inert foreign bodies readily pass between the cells. Further, in the faucial tonsils especially, the gross arrangements of the crypts is such that frequently they form pockets and recesses capable of retaining large numbers of bacteria which find plenty of nourishment in the desquamating epithelium.

Now, it would seem that unless the vital resistance is considerably greater in the tonsil than in the surrounding structures, the tonsillar tissue ought to be the vulnerable spot in the throat. Subject as the tonsil parenchyma is to microbic in-

fluences by absorption of toxins, and also, it may be, of bacteria through the cryptal walls, it was thought possible that there might be developed in the tonsil certain antibodies which would make this structure especially resistant to germ invasion. If it could be demonstrated that the tonsils held in store great quantities of antitoxin and bacteriolytic substances, then one might possibly be justified in believing that the tissue of which they are composed is especially resistant to bacterial invasion.

The following experiments were kindly carried out for me by Dr. M. P. Ravenel. The chief difficulty which seemed to stand in the way of this research was to obtain the soluble portions of the tonsil in a sterile condition, without destroying the immune bodies if such existed, but this was overcome by the use of the Pasteur filter.

About 13 g. of hypertrophied faucial and pharyngeal tonsils, removed from several children, were ground to a pulp in a "broyeur" with about 50 c.c. of sterile water. The mixture was then passed through a Pasteur filter. A part of the filtrate, as a control test, was incubated for one week, and at the end of that time was still clear and sterile.

The rest of the filtrate was treated as follows:

One cubic centimeter of filtrate was added to 5 c.c. of bouillon and inoculated with typhoid bacilli.

Two cubic centimeters of filtrate were added to 5 c.c. of bouillon and inoculated with typhoid bacilli.

After incubation all of these tests showed the same degree of turbidity in the same length of time.

In these experiments it was supposed there was sufficient complement present in the tonsils to cause lysis of the typhoid bacilli, provided the specific immune body was present in sufficient quantity to unite it with them. This was, on the face of it, an unwarranted supposition, and again the known frailty of complements in general was a very poor guarantee for its safe passage through all the manipulation and time requisite to sterilize the tonsillar substance.

Therefore a second series of tests was made. The sterile tonsillar filtrate was obtained as before, the amount of tonsillar substance being the faucial and pharyngeal tonsils from three children in whom hypertrophy of these structures had made operation necessary.

It might very well have happened that the children from

whom the tonsils were removed had never been brought in contact with the typhoid bacillus, and consequently had no specific immunity to this disease, so in this second series a more common micro-organism was employed.

Ten tubes of bouillon were inoculated with the staphylococcus aureus. To eight of these tubes the tonsillar filtrate was added, and to four of these eight fresh serum was added. All ten tubes were then incubated for twenty-four hours, and all showed the same degree of turbidity, that is, equal bacterial growth.

This failure to find immune bodies in the tonsil may be due to a lack of sensitiveness in the technic; or to the simple fact that the reasoning concerning this subject has been false; or it may be that soluble substances are so easily removed by both the blood-vessels and lymph-channels that immune bodies as well as toxins and antitoxins cannot accumulate in the tonsil. To my reasoning this last explanation would seem the most likely. The blood-supply of the tonsil is fairly rich and the efferent lymph-stream is a decided entity, so that a soluble substance could probably not remain long in the tonsillar structure. The rapid and marked systemic intoxication seen in cases of simple tonsillitis shows that some toxins, at least, are readily absorbed from the tonsil into the general circulation, and it is more than probable that the first general symptoms are due to toxic absorption through the blood-vessels. The slowness of the lymphatic method of infection is shown by the fact that enlargement and tenderness of the tonsillar lymph-gland at the angle of the jaw is not always present in simple tonsillitis, and is almost never present at the very beginning of the attack.

It seems, therefore, scarcely possible for a great quantity of immune bodies to accumulate in the tonsil, and it is much more probable that the larger amount of such material enters the general circulation. This failure to find any considerable amount of immune bodies in the tonsillar tissue, as has been indicated, leaves us still uncertain as to the degree of vital resistance of the tonsillar structure.

Of later years there has been a great deal of work done in regard to the susceptibility of the tonsil to tuberculous infection, but as I have already gone over the literature of this subject rather thoroughly as late as 1904, I will simply mention some of the deductions and give the bibliography which bears on the subject of this paper.

In pulmonary tuberculosis the expectoration is coughed up so that it comes in nearly equal contact with all parts of the respiratory tract except the nose and nasopharynx, and thus a fairly even dose of tubercle bacilli is spread over the mouth, pharynx, and larynx. In one hundred and thirty-six cases of pulmonary tuberculosis reported by seven different observers, the tonsils were involved ninety-four times. That is, in 69 per cent of pulmonary tuberculosis the tonsils were diseased. In 1904 I reported nine cases of pulmonary tuberculosis in which the tonsils were examined at autopsy, and in every one I found histologic changes sufficient to justify a diagnosis of tuberculosis. This evidence is pretty strong, showing that, at least as far as tubercle bacilli are concerned, the tonsil is much more easily invaded than any other part of the upper respiratory tract. This argues against the theory that the tonsillar tissue is especially resistant to bacteria. The question, however, is so important that it was thought worth while to examine a sufficient number of cases to positively determine the tonsillar vulnerability to the tubercle bacillus at least; so during the past year I made a careful postmortem study of the tonsils of thirty-seven cases, who clinically were supposed to have died from pulmonary tuberculosis.

These cases are reported in some detail as to the histological condition of the tonsils, with a brief synopsis of the general tuberculous involvement. The numbers attached are the regular numbers at the Phipps Institute.

TUBERCULOSIS OF THE LUNGS WITH TUBERCULOSIS OF THE TONSILS.

Case No. 903. Left pleura showed adhesions everywhere. Left lung, upper lobe showed a large cavity and infiltration, lower lobe was partially consolidated. Right pleura showed dense adhesions everywhere. Right lung, upper lobe showed numerous cavities with excess of fibrous tissue, and the middle and lower lobes a few isolated tubercles. The liver, spleen, and kidneys showed tuberculous lesions.

Tonsils were very small and portions of the cryptal epithelium infiltrated. The germinating follicles were few and small. There was marked fibrosis. A few discrete but distinct tubercles were found, showing caseation and typical giant cells.

Case No. 2632. Left pleura was thickened, with adhesions

at apex. Left lung, upper lobe showed one large cavity with several small ones, lower lobe was compressed and infiltrated. Right pleura was thickened, with adhesions everywhere. Right lung, upper lobe was pneumonic, with numerous tubercles, middle and lower lobes were partially infiltrated. The liver, intestines, kidneys, and lymph-nodes showed tuberculous involvement.

Tonsils were small with only slight infiltration of the cryptal epithelium and very few germinating follicles. There were discrete tubercles with giant cells.

Case No. 2727. Left pleura showed adhesions. Left lung, upper and lower lobes showed cavity formations and coalesced tubercles. Right pleura showed adhesions at apex. Right lung, upper lobe showed one large cavity, middle and lower lobes were infiltrated, with coalesced and miliary tubercles. Spleen was tuberculous.

Tonsils were moderate in size, congested, and the cryptal epithelium was infiltrated. There was an excess of lymphoid tissue which was infiltrated with polymorphonuclear leucocytes. There were diffuse tubercles with caseation and giant cells.

Case No. 2980. Left pleura showed adhesions everywhere. Left lung, upper lobe showed cavities and consolidation, lower lobe was congested and infiltrated with both coalesced and miliary tubercles. Right pleura showed adhesions everywhere. Right lung, upper lobe showed a cavity and was infiltrated, middle lobe was edematous, lower lobe showed a few coalesced tubercles. Liver, kidney, and spleen were tuberculous.

Tonsils were large and showed considerable lymphoid tissue. There were numerous diffuse and discrete tubercles showing necrosis and giant cells.

Case No. 3052. Left pleura was thickened, with adhesions everywhere. Left lung, upper lobe showed a cavity and pneumonic consolidation, lower lobe showed numerous tubercles. Right pleura showed a few adhesions at apex. Right lung, upper, middle, and lower lobes contained a few tubercles. Larynx was tuberculous.

Tonsils were moderate in size, with numerous follicles. The cryptal epithelium was infiltrated and there was a slight fibrosis. There were a few tubercles with necrosis and giant cells.

Case No. 3182. Left pleura showed adhesions. Left lung, upper and lower lobes showed numerous cavities and were

consolidated. Right pleura showed a few adhesions. Right lung, upper, middle, and lower lobes all showed cavity formation, with more or less pneumonic consolidation. Intestines and kidneys were tuberculous.

Tonsils were very small. The cryptal epithelium was intact and infiltrated. There were no follicles and very little lymphoid tissue. There was marked diffuse tuberculosis with caseation and numerous giant cells.

Case No. 3253. Left pleura showed adhesions over the upper lobe. Left lung, upper lobe showed a small cavity, areas of consolidation, and some excess of fibrous tissue. Right pleura showed adhesions over the upper and lower lobes. Right lung, upper, middle, and lower lobes showed numerous cavities, with consolidation and caseation.

Tonsils were small, had no follicles, and very little lymphoid tissue. There was considerable fibrosis. The epithelium of the crypts was not infiltrated, but the crypts were filled with masses of bacteria, and portions of the epithelium were ulcerated. There were several cartilaginous nodules in the connective tissue. After cutting numerous sections a few tubercles were found showing typical giant cells and caseation.

Case No. 3393. Left pleura showed adhesions throughout. Left lung, upper and middle lobes showed cavity formation and caseous consolidation. Right pleura showed adhesions at apex. Right lung, upper and middle lobes showed small cavities and irregular consolidation. Larynx, intestines and kidneys were tuberculous.

Tonsils were small. The cryptal epithelium was for the most part not infiltrated. There was very little lymphoid tissue and a very few small follicles. There was marked fibrosis. Numerous discrete tubercles were found with giant cells but no necrosis.

Case No. 3405. Left pleura was normal. Left lung, upper lobe showed small tubercles, lower lobe showed caseous pneumonia. Right pleura showed adhesions at apex. Right lung, upper lobe showed one large cavity and infiltration, middle and lower lobes were partially consolidated. Liver and spleen were tuberculous.

Tonsils were very small. The epithelium of the crypts was considerably infiltrated and follicles were moderately numerous. There was slight fibrosis. Numerous small discrete tubercles were seen and a great many giant cells.

Case No. 3441. Left pleura showed adhesions at apex. Left lung, upper lobe showed several cavities and was infiltrated. Right pleura showed adhesions around the upper lobe. Right lung, upper and lower lobes showed cavity formation, middle lobe showed a few isolated tubercles. Kidneys were tuberculous.

Tonsils were very small. The epithelium for the most part was intact, but was ulcerated in one or two places. There was very little lymphatic tissue and the follicles were few and small and there was marked fibrosis. Several tubercles were found, some with caseation and giant cells.

Case No. 3526. Left pleura showed adhesions everywhere. Left lung, upper lobe showed a cavity and was partially infiltrated. Right pleura showed adhesions everywhere. Right lung, upper, middle, and lower lobes showed cavity formation. Trachea, intestines, and kidneys were tuberculous.

Tonsils were small. There were a few follicles and the epithelium of the crypts was mostly intact. There was considerable fibrosis. There were several discrete tubercles with giant cells.

Case No. 3548. Left pleura showed adhesions about the upper lobe. Left lung, upper and lower lobes showed cavity formation with some caseous pneumonia. Right pleura showed adhesions throughout. Right lung, middle and upper lobes showed cavity formation with some consolidation, lower lobe contained a few coalesced tubercles. Larynx and intestines were tuberculous.

Tonsils were small. The epithelium was generally intact, but necrotic in a few places. The follicles were few and small. There were numerous tubercles with giant cells, but very little caseation.

Case No. 3559. Left pleura showed adhesions over upper lobe. Left lung, upper lobe showed cavity formation, lower lobe was partly consolidated. Right pleura showed extensive adhesions. Right lung, upper, middle and lower lobes showed rather extensive cavity formation. Larynx, trachea, intestines, and kidneys were tuberculous.

Tonsils were small, containing few follicles, and the cryptal epithelium was intact. There was considerable fibrosis. There were numerous diffuse tubercles with giant cells.

Case No. 3633. Left pleura was normal. Left lung, upper and middle lobes showed numerous miliary tubercles. Right

pleura showed adhesions at apex and on diaphragm. Right lung, upper lobe showed several cavities, middle and lower lobes showed miliary tuberculous infiltration. Larynx, intestines, and spleen were tuberculous.

Tonsils were small and contained only a few small follicles. The cryptal epithelium was slightly infiltrated, and that only in a few places. There was considerable fibrosis and there were some cartilaginous nodules in the connective tissue. A few scattered tubercles with giant cells were found.

Case No. 3643. Left pleura showed adhesions at apex. Left lung, upper lobe showed cavity formation, lower lobe contained a very few tubercles. Right pleura showed adhesions at apex. Right lung, upper and lower lobes contained cavities, middle lobe showed a few isolated tubercles. Liver and intestines were tuberculous.

Tonsils were somewhat enlarged and there was considerable amount of lymphatic tissue, but very few follicles. The epithelium was infiltrated. There was some congestion with very slight fibrosis. Several rather diffuse tubercles were found, showing caseation and nuclear fragmentation, but there were no typical giant cells.

Case No. 3677. Left pleura showed adhesions at apex. Left lung, upper and lower lobes contained cavities. Right pleura showed adhesions throughout. Right lung, upper, middle, and lower lobes all showed cavity formation.

Tonsils were moderate in size. The cryptal epithelium was intact and there were very few and small follicles. There was slight fibrosis. There was a diffuse tuberculosis, with a few giant cells, considerable nuclear fragmentation, but little necrosis.

Case No. 3697. Left pleura showed adhesions throughout. Left lung, upper lobe contained a large cavity, lower lobe showed numerous coalesced tubercles. Right pleura showed extensive adhesions. Right lung, upper lobe contained a large cavity, middle lobe contained numerous coalesced tubercles, lower lobe showed very little consolidation. Larynx, intestines, liver and kidneys were tuberculous.

Tonsils were small. The follicles were very few and small. There was considerable fibrosis, though the epithelium was for the greater part infiltrated. Numerous tubercles with giant cells were found and some caseation.

Case No. 3749. Clinical diagnosis was pulmonary tuberculosis with pneumothorax. Unfortunately there were no post-mortem notes as to the condition of the lungs.

Tonsils were moderate in size, with fair amount of lymphoid tissue, but no follicles. The epithelium was for the greater part infiltrated and there was a slight fibrosis. Numerous discrete tubercles were found, with numerous and very large giant cells.

Case No. 3831. Left pleura showed adhesions at apex. Left lung, upper and lower lobes showed cavity formation with caseation. Right pleura was normal. Right lung, upper, middle and lower lobes showed a few tubercles.

Tonsils were small. There was a great deal of fibrous tissue. The epithelium was infiltrated only in places. There was very little lymphoid tissue and practically no follicles. There were fairly numerous discrete tubercles, with giant cells, but no necrosis. Some of the tubercles were evidently being replaced by fibrous tissue.

Case No. 3880. Left pleura showed extensive adhesions. Left lung, upper lobe contained a cavity and some infiltration, lower lobe was infiltrated. Right pleura showed adhesions throughout. Right lung, upper lobe contained a cavity and considerable fibrous tissue, middle and lower lobes contained tubercles, some of which were healed.

Tonsils were medium in size. The follicles were fairly numerous and about ordinary size. The epithelium was infiltrated. There was very little fibrosis. A few tubercles, with giant cells and necrosis, were found.

Case No. 3887. Left pleura showed few adhesions. Left lung, upper and lower lobes contained a few scattered tubercles. Right pleura showed adhesions at apex. Right lung, upper lobe contained a large cavity with some infiltration, middle and lower lobes presented a few isolated tubercles.

Tonsils were small. The epithelium was infiltrated in places; there was marked fibrosis, but fairly normal and fairly large follicles; also some congestion. A very few but distinct tubercles were found with giant cells and caseation. Some of the sections showed no tuberculosis.

Case No. 3907. Left pleura showed adhesions at apex. Left lung, upper lobe contained several cavities, lower lobe was partially infiltrated. Right pleura showed adhesions at apex. Right lung, upper, middle, and lower lobes all contained cavities.

Tonsils were small, the follicles were few and small. The epithelium was slightly infiltrated and there was considerable

fibrosis with very little lymphoid tissue. A few tubercles with giant cells were found.

Case No. 3918. Left pleura showed extensive adhesions. Left lung, upper and lower lobes showed considerable infiltration. Right pleura was not reported on. Right lung, upper, middle, and lower lobes were all more or less infiltrated.

Tonsils were moderately enlarged. The epithelium was infiltrated in only a few places. The follicles were fairly numerous and quite large. There was slight fibrosis and considerable congestion. A very few tubercles, with giant cells, were found.

Case No. 3941. Left pleura showed adhesions at apex. Left lung, upper lobe contained numerous cavities, lower lobe was partially consolidated. Right pleura showed adhesions everywhere. Right lung, upper, middle, and lower lobes all showed cavity formation with infiltration.

Tonsils were rather large, but with very few follicles. The epithelium of the crypts was somewhat infiltrated and there was slight fibrosis. There was marked tuberculosis, with numerous tubercles showing giant cells and caseation.

Case No. 3953. Left pleura showed adhesions everywhere. Left lung, upper and lower lobes both showed cavity formation. Right pleura showed adhesions everywhere. Right lung, upper, middle, and lower lobes all showed cavity formation. Larynx and intestines were tuberculous.

Tonsils were slightly enlarged. The epithelium of the crypts was fairly intact and there was marked fibrosis and few follicles. There was very marked tuberculous infiltration, consisting of both discrete and confluent tubercles. There was some caseation, but the tubercles seemed to be undergoing fibrosis rather than softening. There were numerous giant cells.

Case No. 4010. Left pleura showed adhesions everywhere. Left lung, upper lobe showed numerous cavities with some excess of fibrous tissue. Right pleura showed adhesions at apex. Right lung, upper lobe showed cavities with excess of fibrous tissue, middle lobe showed a few tubercles, lower lobe showed one cavity with a few tubercles. Larynx, intestines, and kidneys were tuberculous.

Tonsils were rather large, with few follicles. The cryptal epithelium was considerably infiltrated and there was marked fibrosis. There were large numbers of discrete tubercles, with numerous giant cells, but very little necrosis.

Case No. 4021. Left pleura showed adhesions in the upper part. Left lung, upper lobe showed cavities, lower lobe showed numerous coalesced tubercles. Right pleura showed adhesions at the apex. Right lung, upper, middle, and lower lobes showed cavities and caseous tubercles. Kidneys were tuberculous.

Tonsils were very small, with a very small amount of lymphoid tissue. The epithelium was intact, and there was marked fibrosis. There were only a few doubtful tubercles.

Case No. 4040. Left pleura showed adhesions at apex. Left lung, upper and lower lobes were almost completely consolidated. Right pleura showed extensive adhesions. Right lung, upper and lower lobes showed cavity formation, with infiltration, middle lobe was infiltrated. Larynx, liver, intestines, and kidneys were tuberculous.

Tonsils were rather large, but there was only a small amount of lymphoid tissue. The cryptal epithelium, though generally intact, was ulcerated in a few places. There was very marked fibrosis and the follicles were few and small. There were numerous tubercles, both discrete and confluent, with giant cells and considerable caseation.

Case No. 4141. Left pleura showed old adhesions. Left lung, upper lobe showed a healed lesion, lower lobe showed bronchopneumonia. Right pleura showed old adhesions. Right lung, upper lobe showed a large cavity, with consolidation, which was not typical, however, of tuberculosis; middle and lower lobes showed bronchopneumonia. Kidneys and spleen showed doubtful tuberculosis.

Tonsils were small. Cryptal epithelium was slightly infiltrated. Follicles were small, but fairly numerous, and there was no fibrosis. There were a few very doubtful tubercles found.

Case No. 4155. Left pleura showed adhesions everywhere. Left lung, upper and lower lobes showed cavity formation and caseous infiltration. Right pleura showed adhesions at apex. Right lung, upper and middle lobes showed cavity formation with fairly numerous tubercles. Larynx, liver, and intestines were tuberculous.

Tonsils were very small and had very few and small follicles. There was marked fibrosis and the epithelium was generally intact. There were a few tubercles with giant cells, but no necrosis.

Case No. 4281. Left pleura showed some adhesions along the axillary line. Left lung, upper lobe showed a cavity and was infiltrated, lower lobe was partially consolidated. Right pleura showed adhesions in axillary line. Right lung, upper, middle, and lower lobes all showed tuberculous infiltration. Larynx, trachea, liver, intestines, kidneys and spleen were tuberculous.

Tonsils were small and the follicles were very few and small. The epithelium was active in some places and there was considerable fibrosis. There were a few distinct discrete tubercles with giant cells, but no fibrosis.

TUBERCULOSIS OF THE LUNGS WITHOUT TUBERCULOSIS OF THE TONSILS.

Case No. 3896. Left pleura showed a few adhesions. Left lung was practically normal except for a small healed lesion and a few miliary tubercles. Right pleura showed adhesions at apex. Right lung, upper lobe showed cavities and some consolidation, middle and lower lobes were partly consolidated.

Tonsils were somewhat enlarged. There were numerous follicles. The epithelium of the crypts was infiltrated. One of the crypts contained a calculus. There was slight fibrosis and some cartilage in the connective tissue; also some congestion. No tuberculosis was found.

Case No. 4023. Left pleura showed adhesions everywhere. Left lung, upper lobe showed a cavity, with excess of fibrous tissue, lower lobe showed a few isolated and coalesced tubercles. Right pleura showed adhesions everywhere. Right lung, upper, middle, and lower lobes all showed cavity formation. Liver and large intestine showed tuberculosis.

Tonsils were extremely small and showed almost no lymphoid tissue or follicles. The epithelium was almost everywhere intact. No tuberculous changes were found.

Case No. 4140. Left pleura showed extensive adhesions. Left lung, upper and lower lobes were infiltrated. Right pleura showed extensive adhesions. Right lung, upper, middle, and lower lobes showed tuberculous infiltration. Intestines were tuberculous and showed a perforating ulcer which by causing peritonitis was the evident cause of death. Kidney and spleen were also tuberculous.

Tonsils were moderate in size. Crypts were generally in-

tact and there were only a few small follicles, but marked fibrosis. No tuberculosis was discovered.

NON-TUBERCULOUS CASES.

Case No. 3537. Left pleura showed adhesions at apex, but the case was not proved at autopsy to be tuberculous. There were scattered areas of pneumonia in each lung, and numerous small foci, containing a thick, creamy, pus-like substance, and a few other areas which looked suspiciously like tubercles.

Tonsils were large, containing numerous and fairly large follicles. The epithelium was greatly infiltrated, and there was a slight fibrosis. No tuberculous changes were discovered.

Case No. 3699. There was a pleuritic effusion on the left side, with hypostatic pneumonia in the lower lobe. The right lung was nearly normal. Patient died of valvular heart disease.

Tonsils were large, with infiltrated epithelium, a slight fibrosis, marked congestion, and small but fairly numerous follicles. No tuberculous changes could be found.

Case No. 4116. Left pleura was normal. Left lung, upper and lower lobes showed no tuberculosis. Right pleura showed adhesions throughout, and there was a purulent pleurisy. Right lung was collapsed, but showed no tuberculosis. The spleen showed areas of possibly healed tubercles.

Tonsils were large. There was considerable lymphoid tissue and numerous follicles. The epithelium was greatly infiltrated and there was a slight fibrosis. No tuberculosis could be found.

In the thirty-seven cases just outlined, three were found on post-mortem examination to be non-tuberculous. The tonsils of each of these non-tuberculous cases failed to show histological changes at all characteristic of tuberculosis. In the rest, that is, in thirty-four cases, the tonsils of twenty-nine showed absolutely typical lesions of tuberculosis, and two showed lesions which were probably tuberculous, though no typical giant cells were found. In the remaining three of the thirty-four tuberculous cases no change at all characteristic of tuberculosis could be found in the tonsils. In these three cases six to ten slides were examined; all, however, were cut from the same paraffin block, so that by far the greater part of the tonsils was not examined, and it is possible that some portion of the tonsils which was not examined might have been tuberculous.

So far it seems practically proved that for the tuberculosis germ, at least, the tonsil is many more times susceptible than other portions of the throat. Further, I believe that it is a justifiable deduction to say that if one organism passes readily into the tonsillar tisue it is probable that other organisms may do the same thing, provided their pathogenic power is sufficiently great to overcome the tissue resistance. The findings in acute tonsillitis would tend to bear this out. In this disease the number of micro-organisms which invade the parenchyma of the tonsil is so large that they can easily be found with the microscope, and the varieties of bacteria which are capable of producing tonsillitis are very great, including practically all of the pyogenic micro-organisms.

The crypts of normal tonsils are frequently filled with a large number of micro-organisms, but they are seldom found in the parenchyma. The only method, however, of direct investigation—that of microscopic examination—is most unsatisfactory on account of its limitations, in that if only a few micro-organisms are present they may readily escape detection. Inoculation or culture tests are of absolutely no value, as the cryptal ramifications are so numerous and so close together that it would be impossible to obtain any considerable portion of the tonsil without a crypt, and hence contamination.

E. Lexer claims by experimentation to have succeeded in getting streptococci, which had been cultivated so as to have a special virulence toward the rabbit, to enter the crypts, pass through the tonsillar tissue, and to enter the blood within three and a half hours after inoculation. The organisms were found in the tonsillar substance an hour after inoculation.

Piera also demonstrated experimentally that micro-organisms could be absorbed through the epithelium of the crypts, but if they were not capable of resisting the vital action of the tissues they were destroyed practically as soon as they had entered the tonsillar parenchyma.

From the clinical standpoint there is strong evidence that various organisms not only penetrate into the tonsillar substance, but also pass from the tonsil to the general system. The variety of diseases which has been reported as resulting from tonsillar infection includes acute inflammation of nearly all organs. The literature on this subject is rather excessive, but it is well worth while to briefly review some of these articles, as they not only point out the possibility of systemic in-

fection through the tonsils, but are also of value in that they give a more comprehensive view of the subject, representing a greater extent of thought.

I will take up the various diseases separately, giving under each a brief abstract of the individual papers.

RHEUMATISM.

Acute inflammatory rheumatism is now considered by the large majority of clinicians to be an infectious disease, and the possibility that in a certain number of cases the infection arises within the tonsil is being more and more recognized.

Suchannek believes that a considerable number of these cases are caused by tonsillitis.

Meitus says that articular rheumatism is caused by micro-organisms which enter the body through the tonsils.

Packard, after a careful and critical review of the literature on this subject, believes it is possible that there is an attenuation of micro-organisms invading the body through the adenoid tissue of the throat, so that they produce the phenomenon known as articular rheumatism rather than the ordinary septicemia or pyemia.

St. Clair Thompson says that the connection of angina and rheumatism, though undoubted in a certain number of cases, is not yet clearly established. The tonsils may be the port of entry of the rheumatic virus, and this even though the naked-eye appearance of the throat gives no indication of its being affected.

Jakobi admits the close connection between tonsillitis and rheumatism, and advises the removal of large tonsils.

Stengel reports one case, and Turner two cases, of acute rheumatism, within a few days after an attack of sore throat.

In two hundred and seventy cases of acute rheumatism reported by McCrae, only 3.7 per cent had tonsillitis previous to the attack.

Kuhn reports three cases of acute articular rheumatism, following tonsillitis.

Williams and Miller both concede to the tonsils a very important part in the production of acute rheumatism.

A critical editorial in the "Journal of the American Medical Association" says that the tonsils seem to be in a large number of cases the portal of entry of the infection in articular rheumatism.

Gurich reports three cases of rheumatism directly traceable to tonsillar infection, and claims that many cases of acute articular rheumatism are caused by "fossulare angina," and that the rheumatism gets well when the tonsillar disease has been properly treated.

Ingalls, after a careful study of one hundred of his own cases of tonsillitis, reverses his former view, and now believes that tonsillitis plays a very important part in the etiology of rheumatism.

Phillips, in two hundred and ten cases of acute articular rheumatism, found that tonsillitis developed during or before the illness in 18.01 per cent.

Epstein reports one case of rheumatism complicated with pleurisy, following an attack of tonsillitis.

Hammerschmidt reports seventeen cases of rheumatism, in nine of which tonsillitis was present for three to seventeen days before the rheumatic outbreak, and in the rest the throat was more or less inflamed during the attack.

Menzer says that the entrance gate for bacteria in acute articular rheumatism is in the large majority of cases, though not all, the tonsils.

Adler says that rheumatic attacks may follow a very mild tonsillitis.

Miller reports two cases of polyarthritic inflammation, in which he believes the infection was due to frequent attacks of tonsillitis.

Bruck believes that in all forms of rheumatism the tonsils form the gate of entrance par excellence for the infection.

Trousseau was probably the first to show the relation between tonsillitis and rheumatism.

Lagranere and Pipounier showed that acute articular rheumatism was accompanied by rheumatic angina, which occurred sometimes before, sometimes with, and sometimes after, the beginning of the rheumatic attack.

Caesar Boeck reports an epidemic of angina lacunaris, during the convalescence of which the patients regularly developed acute articular rheumatism.

Lasegue reports several cases showing the relationship between these two diseases.

Brown describes a regular epidemic of tonsillitis in school children with rheumatic complications.

Stephanides reports a case of repeated attacks of rheumatism cured by extirpation of the tonsils.

Whipham collected six hundred and fifty-five cases of acute articular rheumatism in which inflammation of the tonsils played a most important part.

Roos reports six cases of angina followed by articular rheumatism.

Peltesohn says that "angina lacunaris, acute articular rheumatism, muscular rheumatism, and certain diseases of the skin occrring with these, are etiologically diseases very close to each other."

Goodale says that in a certain percentage of cases the good operative results following the removal of tonsils seem to justify the theory that the faucial tonsils may constitute an infection atrium for rheumatic arthritis.

Chronic Rheumatism.—Gurich has claimed to be able to differentiate between chronic articular rheumatism due to tonsillar infection and that due to other causes by removing the tonsil. In the tonsillar infection cases the operation is followed by a reaction in the involved joints. Out of one hundred and two cases of chronic articular rheumatism which were thus diagnosed as due to tonsillar irritation, ninety-eight were permanently healed by the removal of the tonsils.

Goodale has recently shown a relation between certain cases of chronic arthritis and the presence of retained debris in the tonsillar tissue.

GENERAL INFECTION.

Otten reports two cases of general staphylococcic infection originating from the tonsils.

Woodcock reports one case of pyemia and phlebitis following tonsillitis with abscess, which was cured with antistreptococcic serum.

Stengel, White and Evans report one case in which the streptococcus was found in the blood and in the tonsils.

Tishutkin reports one case of fatal septicemia originating from a collection of pus in the right tonsil.

Edson describes one case of septicemia which he believes was probably caused by an infection of the tonsil.

Wainwright reports one case of fatal pyemia following tonsillitis.

Owen reports one case of septicemia following tonsillitis.

Jessen reports four cases of general infection following tonsillitis.

Buschke reports four cases of systemic infection following tonsillitis.

Adler reports two fatal cases of general septic infection, in which he believes the infecting germ originated from a mild tonsillitis.

Anderson believes very strongly that the tonsils are frequently portals of infection.

Jacobi, while saying that the modern custom of making the tonsil exclusively responsible for the admission into the system of microbes and toxins is unjustifiable, admits that such invasion may occasionally take place.

Trautmann says that it is possible that many of the infectious diseases originate through the tonsils.

Obtulowicz has seen a case of general infection following angina.

Buss has seen a case of tonsillar inflammation followed by general infection and extensive phlegmon of the skin of the elbow.

Babes autopsied a case of septic infection of all the organs due to a moderately severe tonsillitis; streptococci were found in large numbers.

Buborst describes two cases of severe infection developing after an angina.

NEPHRITIS.

Morse reports five cases of acute nephritis following tonsillitis.

Hammerschmidt reports five cases of nephritis following tonsillitis.

Adler says that 75 per cent of all cases of tonsillitis are accompanied by a mild type of nephritis, which occasionally becomes chronic.

Thouvenet reports one case of nephritis subsequent to an atack of acute tonsillitis.

Baduce reports four cases of angina followed by nephritis, in which the diplococci of pneumonia were found in the blood until the case was cured.

Jeppe saw five cases of angina with nephritis.

Czajkowski reports seven cases of acute nephritis associated with angina lacunaris.

TENOSYNOVITIS.

Tracy reports two cases of acute tenosynovitis following acute tonsillitis.

ENDOCARDITIS.

Ross reports one case of streptococcic endocarditis following tonsillitis. Streptococci were found both in the blood and in the tonsils. He believes that in most cases of infectious diseases tonsillitis is a prominent symptom.

Charrin reports one fatal case of staphylococcic endocarditis following an attack of acute tonsillitis.

Mayer reports one case of endocarditis following an attack of tonsillitis.

Packard reports five cases of endocarditis in which he believes that the infection gained access to the blood through the tonsils.

BRONCHITIS.

Hammerschmidt reports six cases of bronchitis occurring in healthy men, following tonsillitis.

PNEUMONIA.

Hammerschmidt reports two cases of bronchopneumonia and two cases of lobar pneumonia following tonsillitis.

Adler reports one case of streptococcic pneumonia resulting from a streptococcic tonsillitis.

Wallace reports one case of pneumonia following a severe inflammation of the throat.

PLEURISY.

Heddaeus reports one case of pleurisy and pneumonia following a staphylococcic tonsillitis. He believes the pneumonia to be a coincidence, the pleurisy due to the staphylococcus.

Huguenin reports one case in which double-sided pleurisy developed after a severe angina due to the staphylococcus pyogenes aureus.

Gougenheim reports one fatal case of pleurisy and pericarditis following streptococcus angina.

APPENDICITIS.

Forchheimer reports one case of appendicitis following tonsillar infection.

Freeman (discussing Forchheimer's paper) reports one case of appendicitis following tonsillitis.

Mitchell reports one case, coming on a few days after the onset of tonsillitis, and later followed by nephritis and endocarditis.

JAUNDICE.

Forchheimer reports five cases of jaundice following tonsillitis; three to ten days elapsing between the onset of the two diseases.

PHLEBITIS.

Trumbull reports one case of fatal phlebitis following tonsillar infection.

Wagner reports two cases from which an apparently slight angina produced a suppurative thrombosis of the jugular vein, followed by pyemia. Streptococci were found in the tonsils and vein.

Hager and Sahli report cases similar to those of Wagner.

MENINGITIS.

Hammerschmidt reports one case of meningitis due to Fraenkel's diplococcus, which organism was also found in the tonsil.

Perigord reports one case of fatal meningitis following abscess in the left tonsil.

De Guelder reports one case of streptococcic angina complicated with meningitis.

PAROTITIS.

Hammerschmidt reports twenty-five cases of parotitis, and all except one were accompanied sooner or later by tonsillitis; three before, fifteen at the same time, only six after the parotitis had set in.

SKIN LESIONS.

Le Gender reports four cases of erythema following tonsillitis.

Leven reports one case of scleroderma following tonsillitis.

Legendu and Claisse report one case of erythema developing during an attack of streptococcic tonsillitis.

Bruck reports four cases of rheumatica purpura following tonsillitis.

EYE LESIONS.

Vergely reports one case of phlegmon of the orbit, directly following acute tonsillitis.

While the above synopsis of literature concerning tonsillar infection is not a complete list of all that has been written on this subject, it is sufficiently extensive to show that the idea of systemic infection arising through the tonsils is a very general one and not limited to any individual or to any country. Further, a perusal of these articles has given me the distinct impression that the authors of these various papers have been impressed with the importance of the tonsil as a gateway for infection.

The importance of this literature to the thought which I have attempted to develop is that it unquestionably shows that if the micro-organism has access to the tonsil parenchyma, it is possible that it may pass from there into the blood. As has been stated by Boeri, it is the exception, if indeed it ever happens, that bacteria can pass through a normal blood-vessel wall; hence, for the micro-organism in the tonsil to gain access to the blood it must pass through the cervical lymph-nodes, entering the innominate vein via the jugular lymph-trunk. As the lymph-chain of the neck presents a rather formidable barrier against the invasion of micro-organisms, the large majority of patients suffering from microbic infection of the tonsil pass through the disease without any true bacteremia. On the other hand, the absorption by the blood-vessels, of toxins which have been elaborated in the tonsils is a process which accompanies almost every lesion in this organ dependent upon bacteria. The marked systemic depression noticeable in acute tonsillitis is an example.

The relation which the upper respiratory tract holds to pleurisy, as far as the blood route is concerned, can now be quite definitely stated. In a large majority of persons the tonsils act as a source from which bacterial products of greater or less toxicity may gain access to the general system. Further, it can be conceived that there is a degree of toxicity which under ordinary circumstances, as found in the healthy person, would have absolutely no influence. In a person who has been subject to attacks of pleurisy, possibly dependent upon a pulmonary condition, it can readily be conceived that the absorption of toxic substances from the tonsils may be a direct exciting cause to further pleuritic disturbances. In those much rarer cases wherein bacteria themselves gain access to the blood from the tonsils, if the pleura for some reason presents a place of lessened resistance the bacteria may be deposited at this point and there develop.

On the other hand, if the person be in a normal state of health there is no reason why the pleura should suffer from tonsillar infection more than any other portion of the body. This statement is borne out not only by investigation, but also by clinical observation, as shown by reported cases.

We shall now consider the lymphatic infection. A lymphatic infection is naturally propagated via the lymphatic system, passing readily through the vessels, but retarded at each lymph-gland until the functional activity of that node has been overcome. Therefore, concerning lymphatic infection of the pleura from the throat, it is essential, first, to find out whether there normally exist lymphatics connecting the upper deep cervical lymph-glands with the apical parietal pleura; second, if such do not exist, whether diseased processes by cutting off the normal flow of lymph can produce a collateral circulation, whereby lymph from the upper glands of the neck may come in contact with the pleura or its regionary glands.

The lymph-glands of the neck are divided into two groups, the superficial and the deep; the superficial glands drain into the deep ones, generally into the gland which is anatomically the nearest neighbor. The superficial lymph-nodes do not fall within the scope of the present article.

The deep glands situated on each side of the neck comprise from fifteen to thirty nodes on an average, although these figures do not represent the extremes of variation. This group of glands is variously termed the carotid chain, the substernomastoid group, or the deep lateral glands of the neck, and may theoretically and clinically be divided into two groups, although anatomically they seem to make up one continuous mass. They extend from just beneath the ear downward under the sternocleidomastoid muscle, sometimes only as far as the point where the omohyoid crosses the vessels and nerves, but occasionally reaching as far as the junction of the internal jugular and subclavian vein. A gland situated in the notch formed by these veins is for our present purposes of the utmost importance, as will be seen later.

The more superficial division of the deep lateral chain lies posteriorly and is called the external group. The external glands are generally small, and placed in part beneath the posterior border of the sternocleidomastoid, and occasionally extend so far down the anterior border of the trapezius muscle as to come into rather close relation with the supraclavicular glands. The anterior or deeper division of the main group is placed directly over the great vessels of the neck, and is termed the internal jugular group. They are situated beneath the anterior border of the stenocleidomastoid muscle, and when enlarged may be forced anteriorly until some of them appear immediately below the angle of the jaw.

The external glands empty their lymph into the internal jugular group, which in their turn drain one into the other as they descend down the neck, finally emptying into the jugular lymph-trunk. This lymph-trunk empties into the junction of the internal jugular and subclavian veins, and on the left side of the neck is occasionally joined, just before it enters the vein, by the thoracic duct.

The supraclavicular glands occupy the subclavian triangle, and the possibility of connection between this group and the deep cervical glands of the neck is the chief contention in the question of infection from the throat reaching the pleura. The supraclavicular glands receive lympathics from the posterior part of the hairy scalp and from the muscles of the neck; also, from the skin of the arm and

chest, and an efferent branch from the humoral chain of the axillary group. Their efferent duct generally empties into the jugular trunk just before it enters the vein. They are separated from the apical pleura by the axillary plexus of nerves and scalene muscles.

In an interesting series of experiments, Fleiner showed that the supraclavicular glands are regionary to the apex of the parietal pleura. He injected into the pleural cavities of rabbits and dogs both defibrinated blood and India ink, and killed the animals in from five to forty-five minutes afterward. The supraclaviclar nodes contained blood-corpuscles when blood had been injected, and India ink particles when this had been used. He did not, however, trace out the lymph-vessels connecting the pleura and this set of glands.

To make the chain of connection complete from the throat to the pleura there still remains to be seen whether any anastomosis exists between the supraclavicular glands and the external group of the upper deep lateral chain, the lower nodes of which sometimes reach well down along the anterior border of the trapezius.

In 1900, J. A. Grober published quite an elaborate article in which he contended that infections originating in the upper respiratory tract may pass via the cervical lymph-nodes, not only to the pleural apices, but also to the bronchial lymph-nodes. His experiments consisted in injecting a quantity of India ink into the tonsils of a dog and killing the animal six to seven days later. The cervical glands, also the mediastinal and bronchial, the lung and pleura, all showed the presence of India ink particles. The condition, however, was one of extravasation through the connective tissue of the neck rather than lymphatic absorption. Grober's work is not convincing, and he certainly does not demonstrate the presence of lymph-vessels connecting the supraclavicular with the deep cervial lymph-nodes.

Beitzke, in a most thorough and painstaking article, goes over this whole question very thoroughly. He shows that occasionally there does exist a supraclavicular gland which is separated from the pleural apices by the subclavian artery, the branchial plexus, and loose fat tissue, and which has lymphatic connection with the deep glands of the neck. This, however, is a very rare occurrence. Also that another

gland, that inconstant node which sometimes occupies the angle made by the junction of the internal jugular vein with the subclavian, can be injected from the tracheo-bronchial glands. These findings would seem to indicate that in certain cases, probably more or less rare, there is direct lymphatic connection between not only the supraclavicular glands and the cervical glands, but also between the tracheo-bronchial and the cervical.

Beitzke then goes on and gives in detail the results of the post-mortems of forty-five children who showed some tuberculous lesion. Also, he reports a large number of experiments on guinea-pigs and rabbits. In spite of his anatomical findings, he says in his conclusions that there exists no lymph-vessel leading from the chain of cervical lymph-glands to the bronchial glands, and that infection of the lungs from the cervical nodes can only take place through the blood.

My own injections, made by Gerota's method, seem on the whole to substantiate Beitzke's findings. I will describe in some detail two injections, as they show different types of the lymphatic arrangement in the neck.

Case 1. A new-born child. A dissection was made exposing the upper deep cervical nodes. After failing to inject the whole chain from the tonsillar lymph-node, the lower glands were successfully injected from a node situated just above the omohyoid muscle. After hardening in 10 per cent formalin for two days a careful dissection was made. The injection followed the general course downward of the jugular lymph-trunk, which terminated with a saccular dilation at the junction of the subclavian and internal jugular veins. Just before its entrance into the vein the trunk was joined by the thoracic duct. The supraclavicular group, represented by one large node lying on the anterior fibers of the brachial plexus, was not injected. This arrangement of the gland represents a certain type of cases in which the supraclavicular and deep cervical glands are widely separated.

Case 2. A new-born child. The tonsillar lymph-gland was exposed and an injection made into this node without any further dissection. After hardening for several days in a 10 per cent formalin solution, a dissection of the neck was made, and it was seen that the fluid had filled all the

glands and the main lymph-trunks of the neck. In this dissection the upper deep chain of cervical lymph-nodes was much more extended than in Case 1, and represents a type in which the different groups are not so easily differentiated. First, there was on the anterior border of the trapezius muscle, well down toward the clavicle, a node which had extensive connections with the rest of the deep cervical chain. It did not communicate directly, however, with the supraclavicular glands, though a very small node with which this gland was connected occupied topographically a position very close to the supraclavicular group. The supraclavicular group was here represented by one fairly large gland, which received the blue injection just as did the glands of the deep chain. The efferent vessel of the supraclaviclar node terminated in the lymph-node situated in the notch formed by the junction of the internal jugular and subclavian veins. This gland also received the terminal efferents of the deep cervical chain. The jugular lymph-trunk was the efferent of this gland and consequently was very short, as the distance between it and the junction of the veins was exceedingly small. This node was separated from the apical pleura only by the common carotid artery and connective tissue, and was therefore in closer proximity to the apex of the pleura than was the supraclavicular node.

Case 2 is very instructive in that it demonstrates the close relation which may exist in certain cases between the supraclavicular glands and the lower lying of the deep cervical chain. While in this case there did not seem to be any connection between the glands on the anterior edge of the trapezius and the supraclavicular glands, they are topographically very closely related, and knowing the variability of lymph-glands and vessels generally it is conceivable that there may be cases in which anastomosis between these two groups exists. Such have been reported by Beitzke. Further, the injection of the supraclavicular gland took place evidently against the current and was due to the node situated in the venous notch obstructing the downward flow, so that the fluid on entering this node probably passed as readily up the efferent of the supraclavicular gland as into the jugular trunk.

From a study of these cases and of the literature it seems that there must be a great variance in the anatomical ar-

rangements not only of the individual nodes of one group, but also of the relations of one group to another. In a large majority of cases the cervical lymph-nodes are separate from the supraclavicular, but it is probable that in isolated cases there exists some lymphatic anastomosis between these two groups. If we accept Fleiner's statement concerning his work, we must believe that the supraclavicular are regionary to the parietal pleura at the apex, and then the chain from tonsil to pleura is completed. In a few injections in which I tried to find lymph-vessels connecting the pleura with the supraclavicular nodes I failed absolutely, but this negative finding does not prove anything.

One other way for an injection to reach the pleural apex from the supraclavicular gland is through the continuity of structure. If the supraclavicular glands should become enlarged, break down, and give rise to a periadenitis, the proximity of the pleura to this group of nodes makes the involvement of the pleura conceivable. The scalene muscles and some loose areolar tissue, and the brachial plexus of nerves, however, separate the glands from the pleura at this point, so that the process must be rather extensive before the pleura can be reached. The node occupying the venous notch and belonging to the deep cervical group comes in closer relation to the apical pleura than the supraclavicular glands, being separated from it only by the carotid artery and its sheath. Enlargement of this node sufficient to cause displacement either anteriorly or posteriorly would bring its capsule into almost direct contact with the pleura. A cellulitis originating from this node might, therefore, quite easily infect the apex of the parietal pleura. We must remember, however, that this gland is the terminating node of the deep chain, and in the large majority of instances the infection does not pass the barriers presented by the glands higher up. Again, it is not a constant condition, its absence being much more common than its presence, so that, considering the question from all sides, it is doubtful whether many cases of pleura infection ever arise directly from it.

It would seem that if the supraclavicular nodes were in the path of infection some light might be obtained on the present question by a careful histological study. This group

of nodes, therefore, was taken post-mortem from a number of cases of pulmonary tuberculosis and carefully examined microscopically. Some of the glands were found to be normal, others showed adenitis, and the majority more or less tuberculous change. If it had been found that these glands constantly showed advanced and especially old tuberculous lesions, it would be an indication that they were in the route of the original infection; a constant negative finding would indicate otherwise. The pathological changes, however, occupied such a midway positon as to throw no light whatever upon the etiological importance of these nodes.

During the study of these glands some other interesting conditions were noted, and for this reason the examinations are recorded. In describing the size of the nodes only an arbitrary measure is used. If the gland was considerably less in size than a pea, it is called very small; if about the size of a pea, it is termed small; if about the size of an almond, it is termed moderate; if about the size of a cherry, large; and any larger than a cherry, very large. Both the number and size of the glands varied very markedly in different individuals.

In recording the amount of tuberculous change as found in the glands, I have used the term "slight" when only one, two, or three tubercles were to be found; "moderate" when less than one-third of the gland was involved; and "markedly tuberculous" when more than one-third was involved.

Case 1. Eight glands examined.

Three very small ones showed marked tuberculosis.

One moderately large one showed slight tuberculosis.

Two very small ones showed no tuberculosis.

In all of these six a moderate degree of proliferative adenitis and some anthracosis were seen.

One small gland showed slight tuberculosis, with slight proliferative adenitis.

One small gland was normal.

Case 2. Only one moderately large gland examined. This gland showed moderate tuberculosis, with slight congestion.

Case 3. Two large glands examined.

One showed marked tuberculosis with slight fibrosis, slight congestion, and slight anthracosis. There was also a little hyaline degeneration.

One gland showed slight tuberculosis with a moderate proliferative adenitis, and a moderate amount of hyaline change.

Case 4. Seven glands examined.

One very small gland showed slight tuberculosis with slight proliferative adenitis; also some blood in the lymph-sinuses with slight congestion.

One large gland showed a moderate degree of tuberculosis, with slight proliferative adenitis.

In none of the other glands could any tuberculous changes be found. The remaining five glands were very small, and all showed a slight degree of proliferative adenitis. In four of them there was some blood in the lymph-sinuses.

Case 5. Fourteen glands examined.

One very small gland showed slight tuberculosis with congestion.

Four small glands showed moderate tuberculosis, and one of them was congested.

One moderate-sized gland showed moderate tuberculosis with slight hyaline changes.

One moderate-sized gland showed slight tuberculosis, but also marked fibrosis with anthracosis and congestion.

The remaining seven glands did not show any tuberculous changes. One very small gland was fibrous, and there were some hyaline degeneration and congestion. Three very small glands were normal. One small gland was slightly congested, and two moderate-sized glands were slightly congested.

Case 6. Eight glands examined. None were tuberculous.

One very small gland was normal.

One small gland was normal.

Two small glands showed slight anthracosis, one of them was slightly congested.

One small gland deeply congested, with slight fibrotic changes.

One moderate-sized gland showed congestion and slight fibrosis.
One moderate-sized gland showed slight anthracosis.
One large gland showed slight anthracosis.

Case 7. Four glands examined.
One very small gland showed slight tuberculosis and slight proliferative adenitis.
Two small glands showed slight proliferative adenitis, but no tuberculosis.
One large gland was slightly tuberculous, but otherwise normal.

Case 8. Twelve glands examined.
Six very small glands showed marked tuberculosis.
One very small gland showed slight tuberculosis.
Two very small glands were normal.
Two moderate-sized glands showed moderate tuberculosis, and one of them also slight hyaline degeneration.
One large gland was markedly tuberculous.

Case 9. Two glands only examined.
Both were small; one showed slight tuberculosis, with slight proliferative adenitis and slight anthacosis; the other had a moderate degree of tuberculosis and some anthracosis.

Case 10. Two glands examined.
One very small gland showed slight tuberculosis with slight proliferative adenitis, some fibrosis and some hyaline degeneration.
One small gland showed moderate tuberculosis, with marked fibrosis.

Case 11. Four glands examined.
Three small glands, one was normal, one showed moderate degree of tuberculosis, one was slightly fibroid.
One moderate-sized gland showed a moderate degree of tuberculosis and some fibroid changes.

Case 12. Two glands examined.
Both were large, and showed a moderate degree of anthracosis and some fibroid changes.

One had a suspicion of tubercle.
One had two tubercles, with slight caseation, but no distinct giant cells.

Case 13. Three glands examined.
One very small gland.
Two large glands.
All showed marked tuberculosis, with marked fibrosis and some blood in the lymph-sinuses.

Case 14. Six glands examined.
Three small glands.
Two moderate-sized glands.
One large gland.

No tuberculous changes were found, but there was a marked proliferative adenitis, and the lymph-sinuses contained a large quantity of blood which was being taken up by endothelial phagocytes.

Case 15. Six glands examined.
Five very small glands showed slight proliferative adenitis, only one of them slight tuberculosis.
One small gland showed slight proliferative adenitis and slight tuberculosis.

Case 16. Four glands examined.
All showed marked tuberculosis. Two very small, one large, one very large.

Case 17. Sixteen glands examined.
Nine very small glands were normal.
Two very small glands showed slight tuberculosis, one of them distinct proliferative adenitis with marked hyaline degeneration.
One moderate-sized gland showed slight tuberculosis and some fibrous nodules, which may have been scars of old tubercles.
One moderate-sized gland showed marked tuberculosis, but was otherwise normal.
Three large glands; two showed slight tuberculosis with proliferative adenitis and some hyaline change, and one showed marked tuberculosis with fibrous nodules.

TABULATED CASES.

Anthracosis	6
Blood in lymph-sinuses	3
Adenitis	10
Fibrosis	7
Tuberculosis	15
Hyaline degeneration	5
Congestion	4

TABULATED SUPRACLAVICULAR GLANDS.

	Very Small	Small	Moderate	Large	Very Large	Total
Tuberculosis, slight	8	2	3	6	..	19
" moderate	..	7	5	..	..	12
" marked	14	..	1	4	1	20
Proliferative adenitis	21	7	3	4	..	35
Anthracosis	6	2	2	3	..	13
Blood in lymph-sinuses	8	3	2	1	..	14
Fibrosis	5	4	3	2	..	14
Congestion	3	4	5	1	..	13
Hyaline degeneration	4	..	2	3	..	9
Normal	15	3	..	..	..	18

It is unfortunate that in the removal of these glands from the body there was no record kept of the side from which the glands were taken, so that a comparative study with the condition of the lungs and pleura is not possible.

In all, one hundred and one glands were examined, taken from seventeen different bodies.

The importance of the size of the gland in the diagnosis of tuberculosis has, I believe, been overestimated. While the large glands were generally tuberculous, they were not always so, and very small nodes, so small as not to be palpable through the skin, and only found by careful dissection, were frequently the seat of quite extensive disease. The frequency with which proliferation of the endothelium of the lymph-nodes was noticed shows that these glands are subject often to some form of irritation, as would be caused by the presence of a weak toxic substance. This proliferative adenitis was found in 37.6% of all the glands examined. In a large number of the bodies examined there was mixed infection of the lungs, and, as has been suggested by Fleiner, the supraclavicular glands being regionary to the apices of the pleura, it is very probable that the tox-

ins elaborated in the apical lesions pass from thence to the apical pleura, and then find their way to these supraclavicular nodes. In conjunction with this fact it will be noticed that in 12.8% anthracosis was present, and in 13.8% blood was found free in the perilymph-sinuses. Now, as it has been shown, there is in the majority of cases generally no connection between the cervical lymph-nodes proper and the supraclavicular glands, and further it would be quite unlikely that extraneous substances could find their way down through the whole cervical chain into these glands. It cannot be conceived that sufficient dust or coal particles can be absorbed through the skin to give such a marked anthracosis as was found in some of these supraclavicular glands. The only possible source, therefore, for anthracotic material to gain access to this set of glands is from the lungs. The coal-dust passing from the lungs into the pleural cavity, and then being absorbed by the parietal pleura, passes to the regionary glands. In the same way hemorrhage, in cases of phthisis, gives the presence of blood in the lymph-sinuses of these nodes precisely as Fleiner found in his experiments. The presence of anthracosis and free blood in the supraclaviclar nodes, therefore, is very strong evidence of Fleiner's contention, that the supraclavicular glands receive lymph-vessels from the parietal apical pleura.

SUMMARY.

In summing up briefly the relations between throat infections and diseased conditions of the pleura, according to the data outlined in the present paper, I believe that the following statements are justifiable.

An infecting focus of the upper respiratory tract, and this is most frequently found in the tonsils, may give rise to a pure toxemia or even to a bacteremia. Toxemia is a very frequent condition, and because of its frequency is the most important form of infection coming from the tonsils. Bacteremia originating from the throat is comparatively rare, though a large number of cases have been reported. In either condition, if the pleura is a point of least resistance, as it is in a large majority of phthisical patients, it may very easily be more or less affected by the poison circulating in the blood. The faucial tonsils may present unrecog-

nizable foci of infection, causing in may individuals a mild toxemia, which toxemia, however, is of importance only when the resistance of the individual is below normal.

In exceptional cases there may exist lymphatic anastomosis between the deep cervical lymph-nodes and the supraclavicular glands. It is probable that the supraclavicular glands receive afferent lymph-vessels which drain the parietal apical pleura. Occasionally the efferent of the supraclavicular gland empties into a node situated in the notch formed by the junction of the subclavian and internal jugular veins. This node may also receive the efferent lymph-vessels of the deep cervical lymph-nodes, and is only separated from the pleural apices by the internal carotid artery and its sheath. It is conceivable that lesions of this gland might cause a retrograde current which would carry the infection to the supraclavicular nodes, or a periadenitis of this node might possibly involve the pleura directly through continuity of structure. The necessary links in this infection, however, are so numerous and independent one of the other, that only in very rare cases would it happen that they would all be present so as to form a direct path from the throat to the pleural apex.

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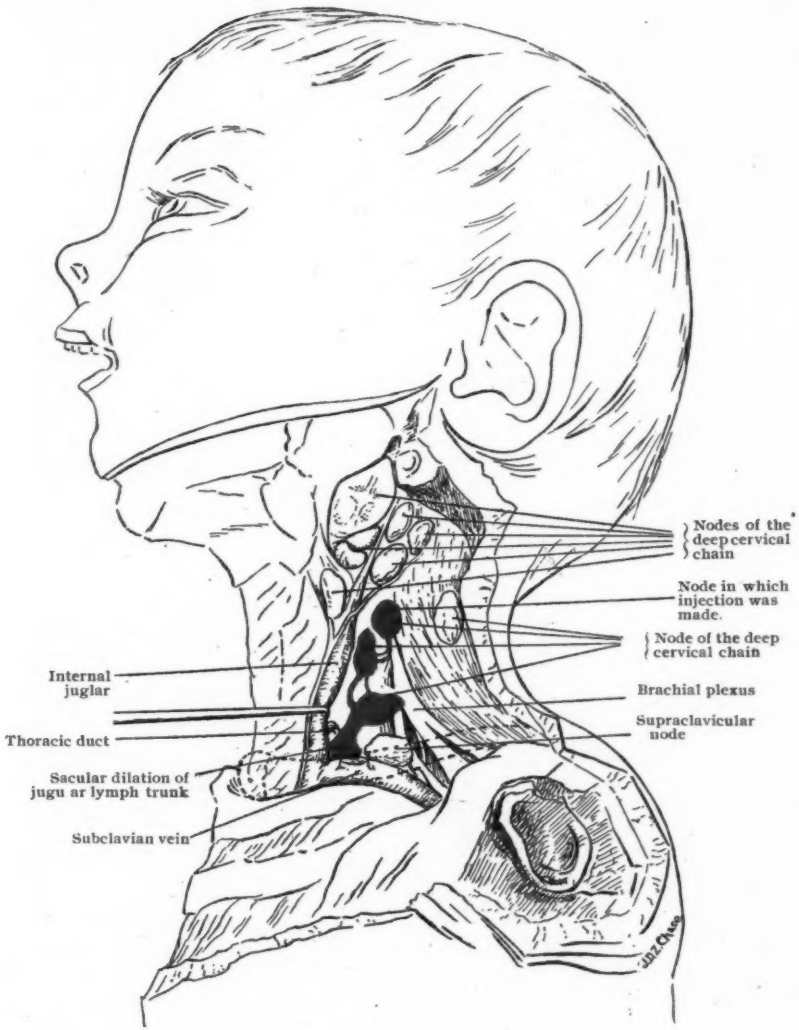

CASE I. Iujection of cervical lymph-glands and vessels showing no connection between supra-clavicular and deep lateral glands. (See page 189.)

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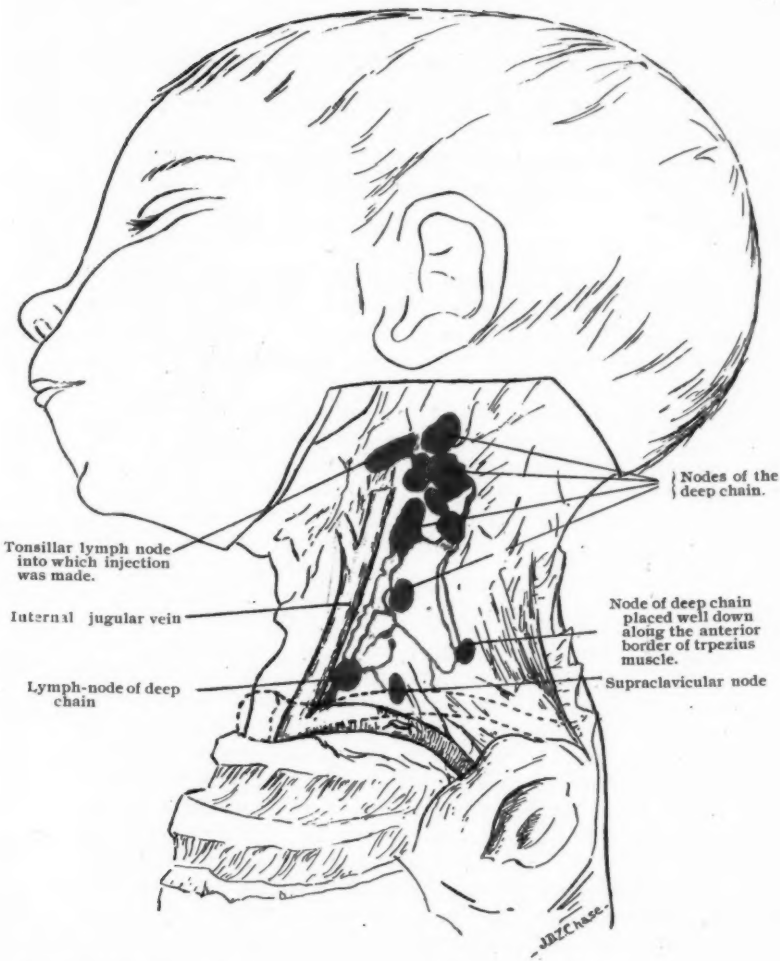
Nodes of the deep chain.
Tonsillar lymph node into which injection was made.
Internal jugular vein
Lymph-node of deep chain
Node of deep chain placed well down along the anterior border of trpezius muscle.
Supraclavicular node
J.B.Z. Chase.

CASE II. Injection of cervical lymph-glands from the tonsillar lymph gland. The efferent vessel of the supraclavicular gland empties into the lowermost node of the deep lateral chain.

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XXXV.

THE MORPHOLOGY OF THE TURBINALS.

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The turbinal bones may be classified, in a general way, according to their function, into respiratory turbinals and olfactory turbinals. They are also classified as maxillary, nasal and ethmoidal turbinals, according to the bones which support them.

Fish. The nasal organs of all fish, except Dipnoi (lung fishes), are used only for olfaction, and so contain only olfactory turbinals or tissue, which corresponds to the olfactory turbinals in other vertebrates. Respiration is, of course, carried on entirely through the gills. In the whitefish of the Great Lakes (Coregonus Clupeiformis) the nasal organs are two irregularly spherical-shaped cavities, separated from each other by a thick septum. They are situated in the anterior part of the head. Each cavity opens externally through two orifices in its external lateral wall, but does not communicate with the mouth. The posterior orifice is supplied with a valve, which when opened permits the water to circulate through the nasal cavity.

On the internal lateral wall of each cavity there are twelve finger-like projections or lamellae radiating from a common center, which are covered with olfactory epithelium in which the filaments of the olfactory nerve end (Fig. A), and they constitute the olfactory turbinals of the fish.

These lamellae, like the turbinals in other vertebrates, increase the expanse of mucous membrane exposed within a limited space, and so increase the acuteness of the sense of smell.

Reptiles. The character and structure of the nose in reptiles is modified by the change in the method of respiration. The nasal fossae become differentiated into a respira-

tory and an olfactory portion. The pterygopalatine arch is well developed and the shelf-like palatine processes of the superior maxillae unite with the palatine bones and form a secondary roof to the mouth. The fossae are thus prolonged backward, below the brain, and open into the nasopharynx.

The Crocodilia, to which order the alligator belongs, are the most highly developed of the reptiles, and their nasal organs are much more complicated than in the fish.

In the alligator, the two nasal cavities are separated in the median line by a rather thick, smooth septum (Figs. C and D, 1). Each cavity opens externally through a small elliptical orifice in the extreme anterior superior surface of the snout. The anterior half of each nasal cavity is the respiratory portion of the nose. There is a round ridge, projecting downward from the roof of this part of the nose (Figs. B and C, 4), which is a true turbinal and is homologous with the inferior or respiratory turbinal in man. The posterior half of each nasal cavity is subdivided into two superimposed cavities of which the upper one is much the larger and may be designated as the olfactory region, for it contains the olfactory turbinals and mucous membrane.

The inferior cavity is simply a round tube, which conducts the inspired air backward from the respiratory portion of the nose into the nasopharynx (Figs. B and D, 8).

The olfactory turbinal is a curved process attached to the roof of the olfactory portion of the nose (Figs. B and D, 2). The posterior end is simply a ridge projecting downward into the nasal fossa, but along the middle portion the turbinal increases in size and its inferior border curves outward toward the external wall of the nose. The anterior portion is much larger than the rest of the turbinal and contains a distinct cell. The olfactory lobe of the brain extends forward and ends just behind the posterior portion of this turbinal, and the olfactory nerves are distributed over it and to the surrounding mucous membrane (Fig. B, 6). The general characteristics of this turbinal correspond quite closely to the middle turbinal, its homolog in man.

Birds. In most birds the anterior portions of the nasal fossae communicate with each other, the septum being incomplete (Fig. E, 1). Posteriorly both fossae open together into the mouth through an elliptical fissure in the middle of the

posterior part of the palate. The turbinals are more highly developed than they are in fish or reptiles.

The Loon (Colymbus) is a web-footed swimming bird, which lives in the cold waters of the nothern hemisphere. It has a long beak and the nasal fossae extend forward in it about one-half of its length. Each fossa contains three turbinals. The most anterior one is attached to the roof and external lateral wall of the fossa by a slender pedicle, which gives off five distinct branches. It is called the vestibular turbinal on account of its location in the vestibule or extreme anterior part of the nose, but it is covered with stratified pavement epithelium and does not correspond to any of the turbinals in man (Fig. E, 2).

Just above the posterior end of the vestibular turbinal, a second turbinal begins and extends backward through the rest of the fossa. Its anterior part is attached to the roof of the nasal cavity and its inferior border is curved outward. As the turbinal extends backward, its attachment shifts from the superior to the lateral wall and it increases in size and becomes more and more rolled, so that in its posterior part it is decidedly scroll-shaped and occupies the greater part of the nasal fossa (Figs. F and G, 3). This turbinal is the homolog of the inferior or maxillary turbinal in man, and it is covered with ciliated epithelium.

The third turbinal is situated in the extreme posterior superior part of the nasal fossa. It is a simple ridge-like structure, supported by a broad base, which is attached to the external lateral wall. Its anterior end contains a small closed cavity (Fig. G, 4). The olfactory mucous membrane is distributed over this turbinal and the roof of the nasal fossa in this region. This turbinal corresponds to the ethmoidal turbinal in man.

MAMMALS. The turbinal structures in mammals exhibit great variations. In microsmatic mammals (animals with an acute sense of smell) the turbinals attain their highest degree of development and are very complicated structures.

The turbinals in the American panther (Felis concolor) are a good example of this high degree of development. The nasal fossae are separated from each other by a thin, straight septum, which unites with the cribriform plate posteriorly. Inferiorly the septum is formed by the vomer and presphenoid,

and superiorly by the descending plates of the frontal and nasal bones. Along the articulation of the perpendicular plate of the ethmoid with these descending plates, a lateral process extends out at right angles into each fossa and supports a considerable portion of the olfactory turbinals and partially subdivides the olfactory portion of the nose into two superimposed cavities (Fig. J, 1).

The maxillary turbinal is in the anterior inferior part of the nasal fossa (Figs. H and I, 2). It springs from the superior maxillary bone by a slender pedicle, which extends out into the fossa, nearly parallel to the floor of the nose, and divides into two branches. The superior branch curves upward, making one complete coil. The inferior branch curves downward and makes two turns within itself. The whole structure is a typical example of the double coiled turbinal, which is present in many mammals. It is the homolog of the inferior turbinal in man.

The naso-turbinal is a rather simple structure, which projects downward from the nasal bone and overlaps the maxillary turbinal and the anterior part of the ethmoidal turbinals (Fig. H, 6). Its homolog in man is the ager nasi, a small bony ridge anterior to the middle turbinal.

The ethmoidal or olfactory turbinals are very complex structures. There are six of these turbinals in each fossa. They radiate from the convex surface of the cribriform plate, and the extent of their surface is tremendously increased by almost innumerable folds and branches, which make an intricate labyrinth occupying the posterior part of each nasal fossa and constitute the olfactory portion of the nose (Figs. H, I and J, 3). Branches from these turbinals extend into all of the accessory sinuses.

The posterior portion of each nasal fossa is subdivided into two superimposed cavities by the lateral wings of the vomer (as it is in the alligator). The superior cavity is the olfactory portion of the nose, and contains most of the olfactory turbinals. The inferior cavity connects the respiratory portion of the nose with the nasopharynx (Figs. H and J, 4).

Apes. The relative position of all of the turbinals is changed in apes and in man. Especially in man, the tremendous development of the fore-brain pushes the ethmoidal and frontal bones forward and the nose appears to recede into

the head. The cribriform plate, in its new position, forms the greater part of the roof of the nose and the ethmoidal turbinals are situated more directly above the maxillary turbinals.

The turbinals in the gibbon or long-armed ape (Hylobates) are comparatively simple structures, but they are less degenerated than those of some other apes. The maxillary turbinal has a double coil, but the superior coil is much smaller than the inferior one and thus shows the tendency toward degeneration and disappearance of this part of the turbinal in the higher animals (Figs. K and L, 2). The ethmoidal turbinals show a much more marked degeneration. There are two in each fossa and their position and general appearance is the same as the ethmoidal turbinals in man (Figs. K and L, 3 and 4). They have entirely lost the numerous fine branches which are present in some of the lower animals, and their number has decreased from five to two. Immediately in front of the ethmoidal turbinals, on the external lateral wall of each nasal fossa, there is a bony ridge, the ager nasi, which is the rudiment of the nasal turbinal (Fig. K, 6).

MAN. The characteristics of the turbinals in man are too well known to need a description here. They are comparatively rudimentary structures, which have reverted to the more primitive types present in the lower vertebrates.

To recapitulate briefly, the turbinal structures of fish (except dipnoi) are used only for olfaction, and are simply ridges covered by olfactory mucous membrane. In reptiles, owing to the changed manner of respiration, the nasal organ functionates both in respiration and olfaction, and respiratory and olfactory turbinals are found. They are, however, quite simple structures. In birds the importance of the respiratory function of the nose increases and the respiratory turbinals show a high degree of development. The expanse of respiratory mucous membrane is very largely increased by the coiled structures of the turbinals. The olfactory turbinals are simple ridge-like structures.

In microsmatic mammals all of the turbinals exhibit a very high degree of development. Their numerous fine branches and coils enormously increase the amount of mucous membrane exposed within a comparatively small space and thus increases the efficiency of the nasal organs. In apes all of the

turbinals have degenerated or reverted to some of the more primitive types. In man the turbinals are quite similar to the turbinals of the ape. They are all rather simple structures. Rudiments of the fourth and fifth ethmoidal turbinals are sometimes found. The ager nasi is the rudiment of the nasal turbinal. Such rudiments are much more frequently present in the embryo than in the adult.

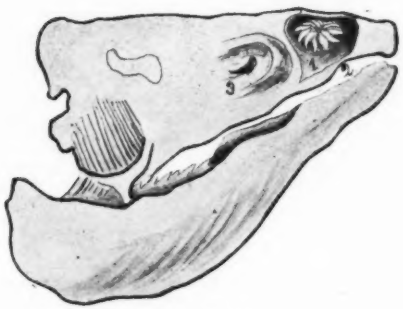

FIGURE A.

LAKE WHITEFISH (Coregonus Clupeiformis). Longitudinal section through the right nasal fossa looking toward the septum.

1. Nasal fossa, showing the olfactory lamellae radiating from a common center on the internal lateral wall.
2. The mouth.
3. The eye.

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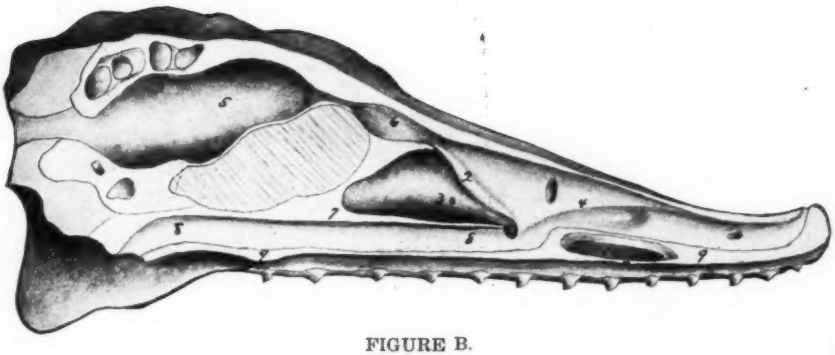

FIGURE B.

ALLIGATOR. Longitudinal section, showing the left nasal fossa.

2. Olfactory turbinal.
3. Pseudo turbinal.
4. Maxillary turbinal.
5. Brain cavity.
6. Olfactory lobe of brain.
7. Lateral wing of vomer.
8. Respiratory portion of the posterior part of the nose.
9. Palate.
10. Maxillary cavity.

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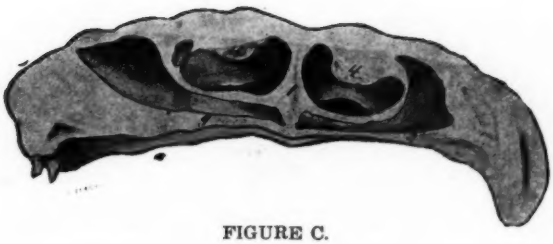

FIGURE C.

ALLIGATOR. Transverse section through both nasal fossae, in the anterior or respiratory portion of the nose, looking anteriorly.

1. Nasal septum.
4. Maxillary turbinal.
9. Palate.
10. Maxillary cavity.

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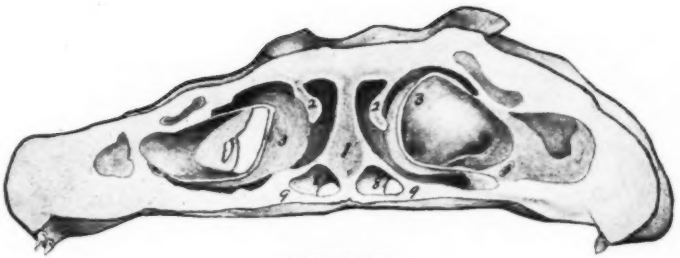

FIGURE D.

ALLIGATOR. Transverse section through the olfactory portion of both nasal fossae, looking posteriorly.

1. Nasal septum.
2. Olfactory turbinal.
3. Pseudo-turbinal.
8. Respiratory tract.
9. Palate.

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FIGURE E.

LOON. Transverse section through the anterior part of both nasal fossae, looking posteriorly (twice natural size).

1. Nasal septum. The free communication between the two nasal fossae in this part of the nose is shown.
2. Vestibular turbinal.

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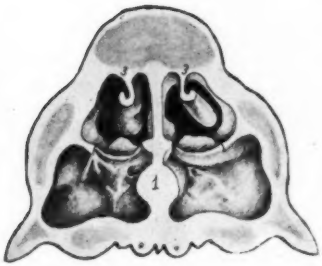

FIGURE F.

LOON. Transverse section through the middle portion of both nasal fossae, looking posteriorly (twice natural size).

1. Nasal septum.
3. Maxillary turbinal.

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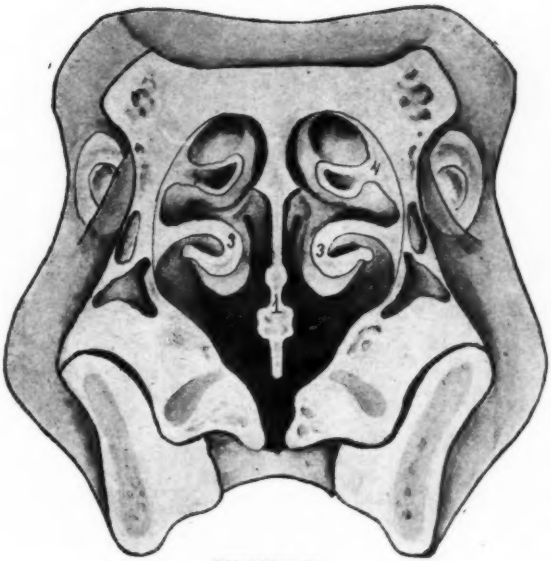

FIGURE G.

Loon. Transverse section through the posterior portion of both nasal fossae, looking posteriorly (twice natural size).

1. Nasal septum.
3. Maxillary turb'nal.
4. Olfactory turbinal.

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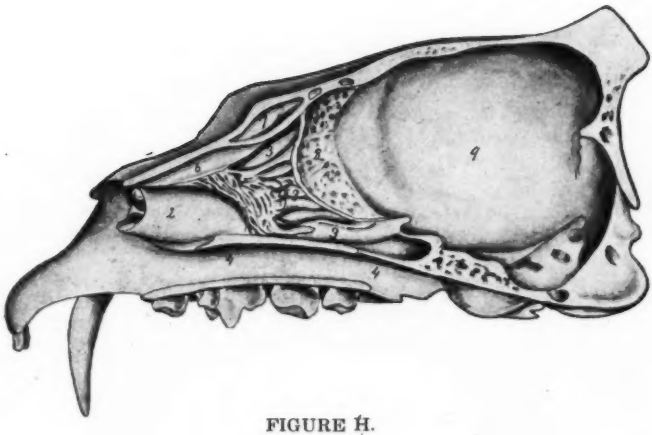

FIGURE H.

PANTHER. Section showing the right nasal fossa of the American Panther (one-half natural size).

2. Maxillary turbinal.
3. Ethmoidal turbinals.
4. Respiratory portion of the nose separated from the olfactory portion by the lateral wing of the vomer.
6. Nasal turbinal.
7. Ethmoidal turbinal in frontal sinus.
8. Cribriform plate.
9. Brain cavity.
10. Sphenoidal sinus.

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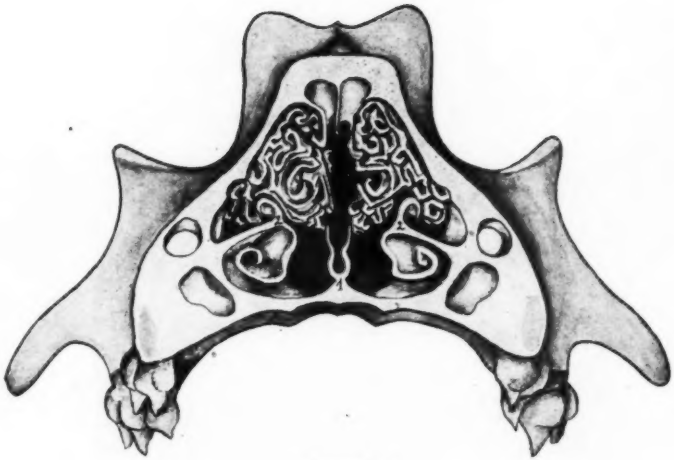

FIGURE I.

PANTHER. Transverse section through the anterior part of both nasal fossae, looking posteriorly.

1. Nasal septum.
2. Maxillary turbinal.
3. Ethmoidal turbinals.

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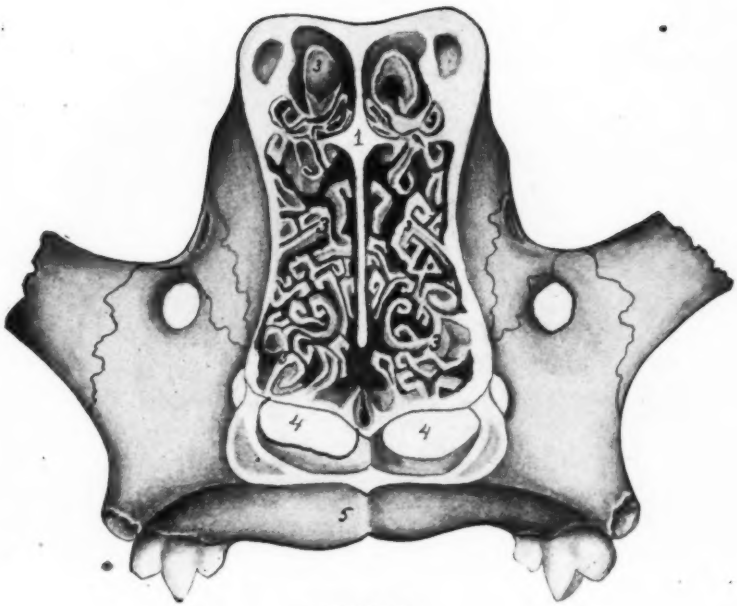

FIGURE J.

PANTHER. Transverse section through the middle portion of both nasal fossae, looking anteriorly.

1. Nasal septum.
3. Ethmoidal turbinals.
4. Respiratory portion of the nose separated from the olfactory portion by the lateral wing of the vomer.
5. Palate.

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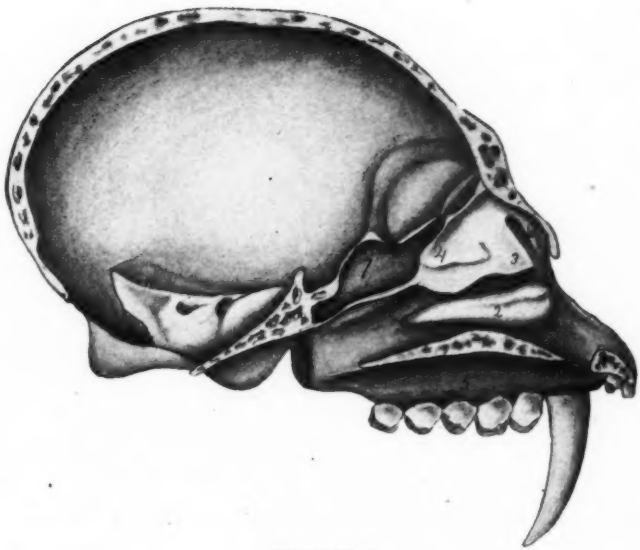

FIGURE K.

APE. Longitudinal section showing the left nasal fossa.

2. Maxillary turbinal.
3. Ethmoidal turbinal.
4. Superior ethmoidal turbinal.
5. Palate.
6. Nasal turbinal.
7. Sphenoidal sinus.

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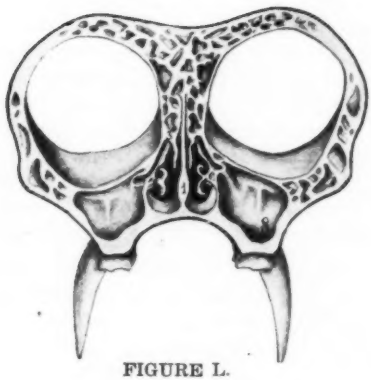

FIGURE L.

APE. Transverse section through both nasal fossae, looking anteriorly.

1. Nasal septum.
2. Maxillary turbinal.
3. Ethmoidal turbinal.
8. Maxillary sinus.

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XXXVI.

GIANT TUMORS OF THE LARYNX.

By Prof. F. Massei,

NAPLES.

From a total of nearly 600 cases in my personal statistics, embracing 38 years of practice, I have selected 10 cases of tumor of the larynx which not only attained extraordinary size, but also presented special characteristics, giving them a certain value pathologically and clinically.

I shall describe them briefly and permit myself a few remarks in the form of conclusions.

The first case, seen in 1872, was that of a man, aged 48, of slight build, who, since his seventh year, had a nasal voice. In his later years he slept involuntarily several times a day. Respiration was noisy, but deglutition was normally effected.

Laryngoscopic Examination.—A tumor almost three centimeters in diameter, round, smooth, pale red in color, of firmly elastic consistence, was implanted upon half the laryngeal surface of the epiglottis, and had invaded the vestibule. Its base was fixed.

Three years after my first examination the tumor had increased in volume and the dyspnea was worse. I proposed tracheotomy and an attempt at ablation of the tumor with a galvano-cautery snare, but the patient refused all treatment and was lost sight of.

From a clinical point of view I shall admit that this was a fibroma. As may be seen in the drawing, it seems much larger than the one shown by Mackenzie in his classic treatise, but it is much smaller than the one described by Rokitansky, which reached the size of a pigeon's egg.[1]

The second case is that of a man, aged 50, of weak constitution,[2] who, for two years, had intermittent hoarseness.

(1) This case was published in my "Les Neoplasmes du Larynx."—See Italian Archives of Laryngology, 1884-85.

(2) Francesco de Feo, of Giffoni Valle-Piana, hairdresser. See No. 285 of my private register.

then becoming constant. When I saw him the first time, in June, 1906, he was aphonic and dyspneic.

LARYNGOLOGIC EXAMINATION.—Springing from the right ventricle of Morgagni is a large mass (shown in Fig. 2) protruding into the glottis. It has a wide base, and in color and appearance resembles an hypertrophied tonsil hanging down in the hypoglottic region.

A part of the tumor has its origin on the right cord.

August 9, 1906, I excised it with forceps and after having removed almost all the growth I discovered that it also took origin from the epiglottic petiole.

Four months later, when I saw him again, he was entirely well.

Microscopic examination by Prof. Martuscelli showed that it was a cystic fibroma, as the cut indicates. (Fig. 11.)

It is known with what facility similar tumors sometimes attain considerable size, and for this reason I will describe briefly another case of this sort:

Case 3.—Man, 46 years old,[1] tall, but weakly, and an epileptic. Seen at my hospital clinic in January, 1898.

Three years previously he had caught cold, but he states that the breathlessness which bothered him had recently increased to the point where suffocation threatened.

LARYNGOSCOPIC EXAMINATION.—An enormous polyp of the left vocal cord, pale, glossy, smooth and mobile, resembling a nasal polyp, occupies the entire laryngeal cavity. (See Fig. 3.)

I decided to operate per vias naturales, but next day the tumor had increased so much in size and the dyspnea had so augmented that I was obliged to recommend a preliminary tracheotomy. Prof. Salvia did this two days later.

Seventeen days afterward, with forceps, I removed the tumor entire, which had shrunk to the size of a bean.

A month later the canula was taken out. The tumor has not recurred.

Prof. Martuscelli, who made the microscopic examination, confirmed my diagnosis of cystic fibroma. (See Fig. 12.)

The striking feature in this case was the rapid increase of size (due perhaps to hemorrhage into the lacunar spaces) and

(1) Raffaele Tramontano, of Capua. No. 106, in my clinical register A.

then the diminution after tracheotomy. Like the preceding case, it shows what a volume may be attained and how many surprises a cystic fibroma of the larynx, usually of small size, may give us.

Case 4.—A little girl of 4 years[1] was tracheotomized in 1904 by Dr. Cardoso, of Tunis, for a violent attack of laryngeal stenosis and was sent to me at Naples eighteen months later, July 14, 1908, for decanulation.

Autoscopy and mirror examination showed a large mass, of cauliflower form, the size of a nut, pale red in color, of irregular shape and surface, which appeared to issue from the esophageal aditus and to be supported by the arytenoid cartilages, which were hidden. The laryngeal vestibule was also involved. (See Fig. 4.)

Any attempt to close or remove the canula stifled the child. On the other hand, intubation was surprisingly successful, and completely reestablished respiration.

I continued the intubation at intervals, alternating by tearing away the papilloma with forceps, either per vias naturales or through the tracheal fistula. Papillomata could also be seen in the trachea, and although the principal mass was gone, the tube would not go any further down in the larynx. By autoscopy I made out a great number of buds springing from the interarytenoid mucosa.

After a year of patient treatment there were only traces of the growth. The canula could be closed for some time. Unfortunately, the little girl was obliged to go back to Tunis to be treated for a tubercular arthritis of the elbow.

Histologic examination by Prof. Martuscelli (see Fig. 13) confirmed the diagnosis of papilloma, no tubercles being found.

In this case, interesting from the viewpoint of extension of the growths, and having an analogy to Bethan Robinson's,[1] I did not want to perform laryngo-fissure, partly through fear of recurrence, which renders all radical intervention illusory, and partly through fear of an invasion of the trachea by papillomata. My patience might have been crowned with success and a cure obtained by a continuation of treatment.

---

(1) Elena Buonocore, of Tunis. No. 282 of my register.

(1) Proceedings of the London Laryngological Society, Vol. XIV, March 8, 1907.

Case 5.—B. R.,[1] 50 years old, pharmacist, was a healthy man who two years ago (1904) noticed a change in the quality of his voice, to which have been recently added attacks of dyspnea and trouble in swallowing.

I saw him Feb. 13, 1906, at my clinic, and with the laryngoscope perceived a tumor of large dimensions which seemed to originate upon the left side of the larynx, covered the larynx entirely, permitting only a very little portion of the right arytenoid to be seen.

It was irregular in form, almost rectangular, and of slaty color, like a congested lung. The transverse diameter was about 4 cm. (See Fig. 5). It was movable at the free end, and in deep respiration was almost drawn into the laryngeal cavity. It was soft to the touch.

I thought of an angioma, originating from the left pyriform sinus, and my first attempts with a galvano-cautery snare causing violent spasms, I advised a tracheotomy, which was done March 5 by Prof. Sorge, at Clinique Hospital.

April 30 I commenced to destroy the tumor by the natural route, and with the aid of the galvano-cautery snare I removed large bits, then cauterized to reduce what remained of the growth. In December the destruction was finished.

Then I was able to discover that the tumor involved not only the pyriform sinus, but all the aryepiglottic fold and the false cord of the same side.

The hemorrhage after each sitting was rather severe, but by continuing the cauterizations and applications of adrenalin such improvement was gained that the tracheal canula could be removed in January, 1907.

Histologic examination confirmed the opinion that it was a cavernous angioma. (See Fig. 14.)

The rarity of such tumors, the large dimensions, the extensive seat and the excellent effect of a simple treatment in which the galvano-cautery snare played an important role, justify the report of this case in which I assisted at a progressive regression ending in complete cure.

Case 6.— A young man of 18, having a rather limited pulmonary tuberculosis,[2] was brought to my hospital clinic December 2, 1905, by Prof. Caporali. My advice was desired

(1) Roberto Gennarelli, of Naples. No. 24 of my register A,.
(2) Ricardo Brugaglia, of Marano. My register A, No. 66.

for an aphonia and an embarrassment of respiration with which he had suffered for three or four months.

LARYNGOSCOPIC EXAMINATION.—A polyp as large as a chestnut occupies the anterior two-thirds of the glottis; it is round, pale, the surface somewhat shagreened, and turns rather to the right side, although seeming to originate at the commissure. (See Fig. 6.)

December 11, with forceps of various models and under cocain anesthesia, I made several attempts at extraction, which failed. Next day, in a fit of coughing, the patient spat out the polyp entire.

Voice and breathing immediately became normal.

Upon examination the larynx appeared wholly normal, and a year later it was impossible to recognize the seat of the tumor.

Prof. Martuscelli found tubercles and giant cells upon histologic examination. (See Fig. 15.)

In 1907 the patient, who took no care of himself, succumbed to pulmonary tuberculosis.

This instance of laryngeal tuberculoma is not without interest, for, besides the contribution which it gives to the polypus or vegetating form of laryngeal tuberculosis, it shows what dimensions these tumors may attain, their relative benignity, the weakness of their point of implantation, which allows their removal with moderate force, and the difficulty of diagnosis by physical signs alone. At first I thought of tuberculoma (after the chest examination and finding the bacilli in the sputum), but the form, the size and the color of the polyp, left a suspicion of adenoma or fibroma.

Case 7.—A young woman, 26 years of age, of Catanzaro,[1] was sent to me by Prof. Scorzelli, in October, 1892, for violent suffocation attacks which necessitated her being sent to the hospital (Incurables).

One month later Prof. di Giacomo was obliged to tracheotomize her, and in December I was called to make another examination.

LARYNGOSCOPIC EXAMINATION.—A large tumor resembling in its general appearance (surface, color) an hypertrophied tonsil, the size of an almond, arising from the right half of the larynx, had invaded all the laryngeal cavity, almost touching the opposite side. (See Fig. 7.)

(1) Rosa Marino. (See No. 45 of my private register.)

It seemed to originate from the epiglottic petiole with a large pedicle and extended to the right aryepiglottic ligament. Its mobility was moderate.

March 16, 1893, with one grasp of the forceps, I took out the entire tumor.

Prof. Oro, who volunteered to make a histologic examination, stated that it was an adeno-epithelioma, but in spite of repeated searches he was not able to find the specimen again four years later.

The patient died after a few months, of a pharyngeal recurrence.

While on the one hand this case shows us that under favorable conditions a laryngeal tumor of bad nature may be entirely removed with a good technic through the natural channel, on the other hand it proves the fatality of malignant tumors and their recurrence in regions distant from the primary seat.

Case 8.—A sailor,[1] very robust, 38 years old, whom Prof. d'Arrigo brought to me November 26, 1904, had suffered for a year with dyspnea. For two months he had received hypodermic injections of sublimate without success.

The patient had a nasal voice, had difficulty in swallowing, was very much oppressed, and the dyspnea was augmented when he tried to sleep.

LARYNGOSCOPIC EXAMINATION.—A large tumor, the size of an apricot, which, like the one in the preceding case, resembles in color and surface an hypertrophied tonsil, appears to arise from the pyriform sinus or the aryepiglottic fold on the right side. It involves all the supravestibular region in such a way that only the left arytenoid (mobile) and the internal surface of the epiglottis can be seen. It is hard to the touch and immobile.

I tried to excise at least a fragment with the galvanic snare, not having an exact idea of the tumor's size, but, as soon as the snare was well in place, such a violent spasm came on that I was obliged in haste to cut the wire.

I then advised tracheotomy, which was done at the Hospital Clinique, in December, by Prof. Sorge.

A month later, by means of a galvanic snare, I removed large portions of the tumor by the natural route, but I must

(1) Francesco Panattieri, of the Island of Lipari. (No. 247 in my private register.)

confess that I undertook a useless task, for an enormous mass remained. I recommended sub-hyoid pharyngotomy, which was done at the hospital, in my presence, by Prof. Sorge, July 18, 1905.

After free section of the thyro-hyoid membrane we came directly upon the neoplasm. I proposed to encircle it with a platinum wire, but this was impossible. Prof. Sorge soon discovered that, as he had foreseen, the tumor was implanted all along the upper border of the right thyroid cartilage, leaving the lateral wall of the pharynx free. He immediately performed a hemi-laryngectomy.

Fig. 8, which was sent to me by my distinguished co-worker, reproduces what was removed.

Unfortunately, 21 days after the operation, the patient succumbed in collapse, probably due to pneumonia ab ingestis.

Histologic examination made after several trials by Prof. d'Arrigo, who gave me the beautiful specimen shown in Fig. 16, showed that it was an epithelioma, though the homogeneous covering gave it the appearance of an adenoma or a fibroma.

Both of these latter cases are rather interesting. Although malignant tumors easily attain considerable size, that in these two cases is remarkable. On the laryngeal side their delimination is marked, while the extra-laryngeal development is extreme.

Case 9.—An old man, 78, robust, following the profession of driver,[1] came to my free clinic in May, 1899, for a very severe dysphagia which had afflicted him for several months.

LARYNGOSCOPIC EXAMINATION.—Epiglottis flat and lowered upon the aditus. On its free border, toward the right side, there is seen a tumor as large as a nut (See Fig. 9) of somewhat rounded form, red, surface uneven, grooved by numerous varicose vessels, very mobile, going beyond the base of the tongue in forced expiration.

When respiration is quiet, or during inspiration, it falls upon the pharyngeal aditus in such a way that one can see only a part of the tumor, that which presses the epiglottis down upon the laryngeal aditus.

In the laryngeal cavity, only a little of the left arytenoid can be seen.

(1) Giacomo Crispino, of Cardito. See No. 271, register A of my clinic, May 9, 1899.

The timbre of the voice is little modified, but the dysphagia is so marked that only liquids can be swallowed, and these even with difficulty.

Upon the backs of both hands and feet, and the external aspects of both forearms, are nodules characteristic of idiopathic hemorrhagic sarcoma of the skin, which was first manifested eight years previously.

Six days later (May 15), under cocaine anesthesia, I attempted to take out the tumor with forceps, but a lively hemorrhage came on and I had to stop. After a week of rest, with the aid of Kirstein's spatula and a snare, I was able to remove the tumor entire.

I watched the patient for three or four years and am sure that he was completely cured.

The microscopic examination by Prof. Martuscelli showed a hemo-angio-endothelioma (See Fig. 17) analogous in structure to that of a cutaneous nodule which I took for the purpose from the palm of the right hand.

Case 10.—A patient 48 years old[1] had suffered since childhood with catarrh of the upper air passages. He is gouty. His mother died at 80 of breast cancer.

For some time he had noticed rattling and defective respiration, which determined him to consult me in May, 1899.

LARYNGOSCOPIC EXAMINATION.—From the right side of the laryngeal cavity a large mass extends to the aryepiglottic fold of that side, effacing the glottis and leaving little space on the opposite side. It is irregular in shape and has a muriform appearance. The color is mainly red with silvery spots here and there. The tumor is partly mobile and appears to originate from the arytenoid cartilage to which it is adherent. Although 40 days previously the patient had spat out a fragment of the tumor as large as a bean, the dyspnea was considerable.

The patient himself drew my attention to several nodules on the left hand characteristic of hemorrhagic pigmentary sarcoma. This is why I at once suspected the real nature of the laryngeal tumor.

Eighteen days after the first visit the patient called me in haste to see him in the country, where he was having violent attacks of laryngo-stenosis. The tumor had enlarged. I prepared for a tracheotomy, but I succeeded with forceps and

(1) Giuseppe Cardone, of Salve. No. 160 of my private practice register.

curettes in taking out, by the natural way, the greater part of the mass, which was friable and bleeding. I then introduced an O'Dwyer tube, which I left for several hours.

Ten days afterward the patient, almost recovered, came to visit me at Naples.

There remained only a small vegetation on the anterior surface of the right arytenoid, which vegetation was removed some months later with a snare by Dr. Villani, of Lecco.

In the nose were some similar growths which my colleague excised in the same way.

Prof. Martuscelli found in this case that the structure was identical with that in the preceding case; namely, hemo-angio-endothelioma. (See Fig. 18.)

These two cases seem interesting to me for the following reasons:

For a long time I have been calling attention to the coincidence of this class of tumors with cutaneous sarcomatosis. I have demonstrated their histologic analogy and their chronologic relation and especially have I brought out the enormous development which these neoplasms may reach in the larynx and isthmus of the fauces.[1]

I am satisfied that systematic examination of the skin in cases of this sort will enlarge the statistics. This is an important matter, for at the beginning Kaposi's cutaneous sarcoma may be mistaken, and although the structure of laryngeal tumors may rank them with sarcomata, often they do not recur after ablation, or, if there is a recurrence, they remain relatively benignant like the cutaneous sarcoids.

It would be difficult for me to explain why these tumors, which, ordinarily, on the skin preserve a rudimentary appearance, attain such size in the larynx. I cannot tell why sometimes we have an infiltration and sometimes a perfectly developed tumor. I confine myself to interpreting them as relatively benignant in accordance with what we know of the cutaneous form, and to saying that I have seen similar neoplasms—genuine hemo-angio-endotheliomata, after Radaeli—in the nose, behind the velum, and on the pharyngeal pillars and walls.

These ten short observations and the brief considerations drawn therefrom lead to the following conclusions:

---

(1) Massei-Martuscelli-Prota: Le complicanse laringee nella sarcomatosi cutanee. Naples, 1899.

1. Certain tumors of the larynx, of good or bad nature, sometimes attain considerable volume and can be called giant tumors.

2. The exaggerated dimensions of these tumors may sometimes be the result of a transitory phase which, in spite of their benignity, may constitute a vital danger.

3. Certain hemo-angio-endotheliomata complicating cutaneous sarcomatosis reach a considerable development in the larynx.

4. Certain others, of malign nature, epitheliomata, for example, in isolated form, may attain an enormous size, especially if extra-laryngeal.

5. The large dimensions do not always permit recognizing the point of origin.

6. The physical characters of giant tumors do not always indicate their nature, so that to make a diagnosis a microscopic examination is necessary.

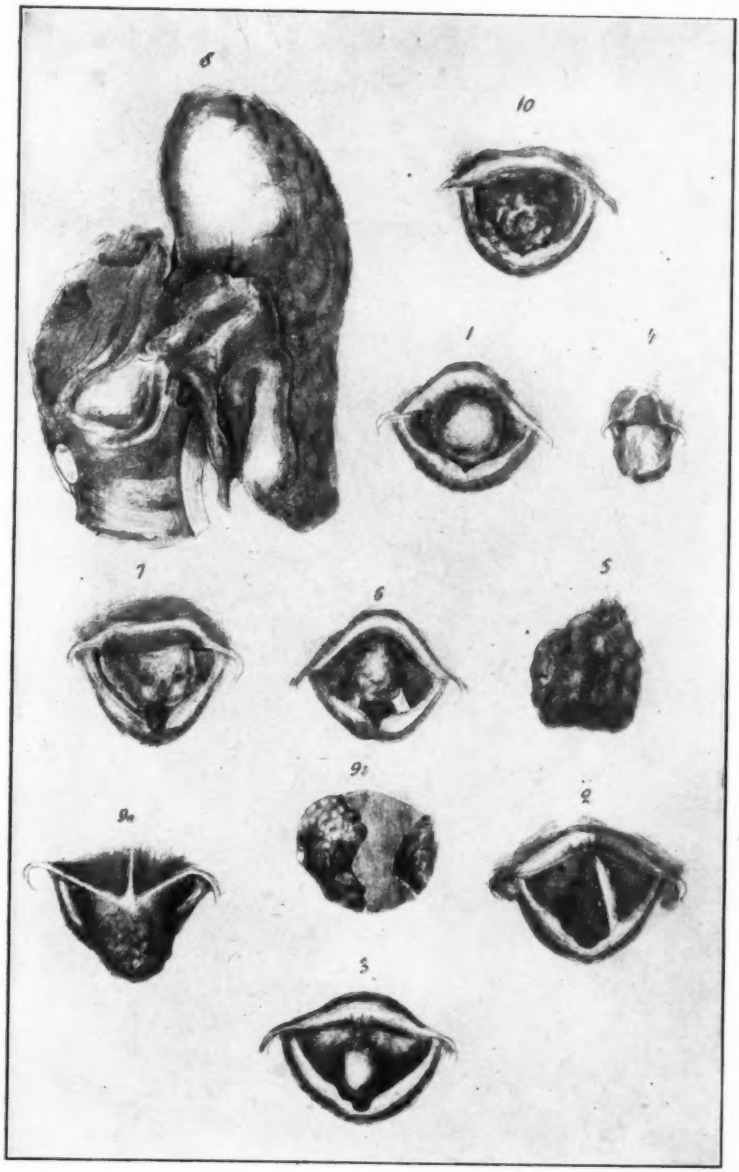
7. From a biologic viewpoint giant tumors of the larynx have a twofold interest: Their volume (taking account also of their implantation), which offers immediate danger; and their nature, either on account of the possibility of a regressive phase, or on account of their malignant character.

8. Local treatment by the natural route, even when a preliminary operation is indispensable, often checks the local infection and puts off the danger of a general infection, provided it be applied with exact knowledge of the neoplasm's nature.

Gentlemen, in our times, when broad culture is indispensable for a specialty, we veterans of very recently formed army note the tide which carries the young toward general surgery and tends to throw aside operations through natural routes which are more simple and frequently offer greater chance of success.

Some of the cases I have just reported were victories for surgery through natural channels, but faith is necessary to overcome the difficulties met along the way.

By the modest contribution which I am giving to this great scientific meeting, I flatter myself that I have brought to light the good that can be done for certain cases (without renouncing, for that matter, classic surgery when necessary) with a patient and delicate technic, and how much an exact diagnosis of the nature of these tumors clears up their importance and significance.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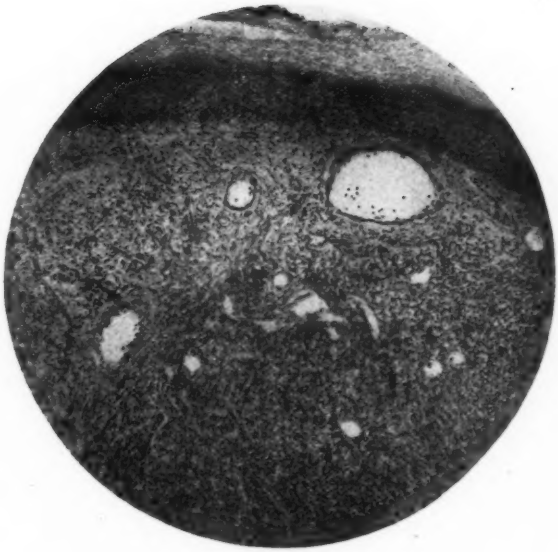

FIGURE 11.
Case 2. Cystic Fibroma. (Figure 2.)

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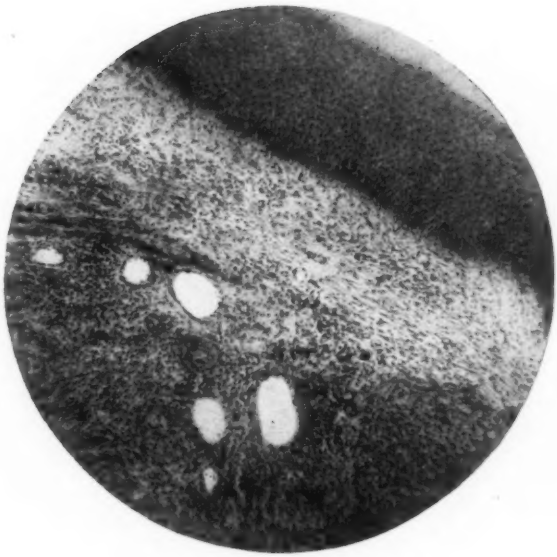

FIGURE 12.
Case 3. Cystic Fibroma. (Figure 3.)

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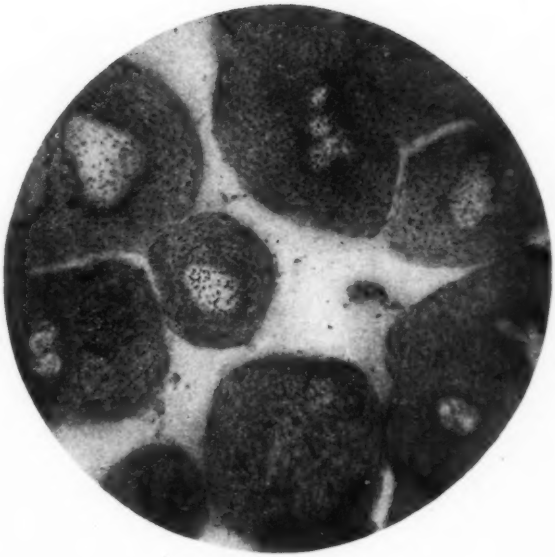

FIGURE 13.
Case 4. Papilloma. (Figure 4.)

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FIGURE 14.
Case 5. Angioma. (Figure 5.)

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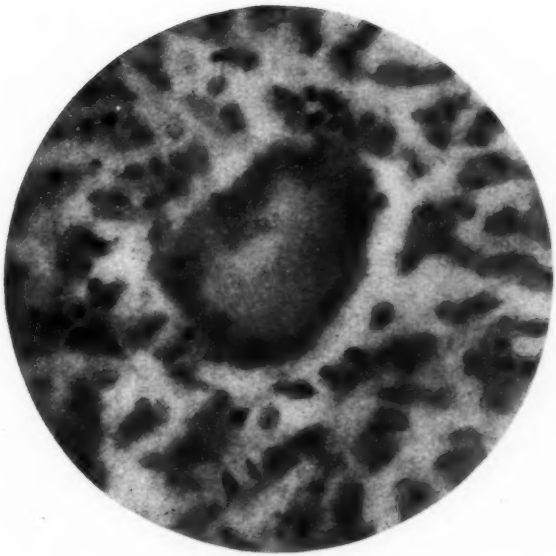

FIGURE 15.
Case 6. Tuberculoma. (Figure 6.)

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FIGURE 16.
Case 8. Epithelioma. (Figure 8.)

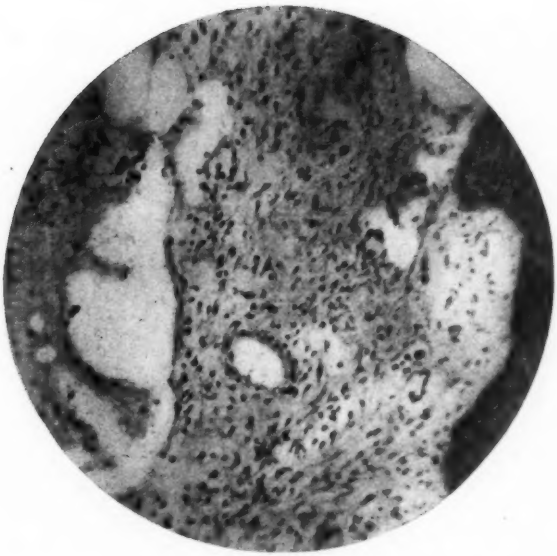

FIGURE 17.
Case 9. Hemo-angio-endothelioma. (Figure 9.)

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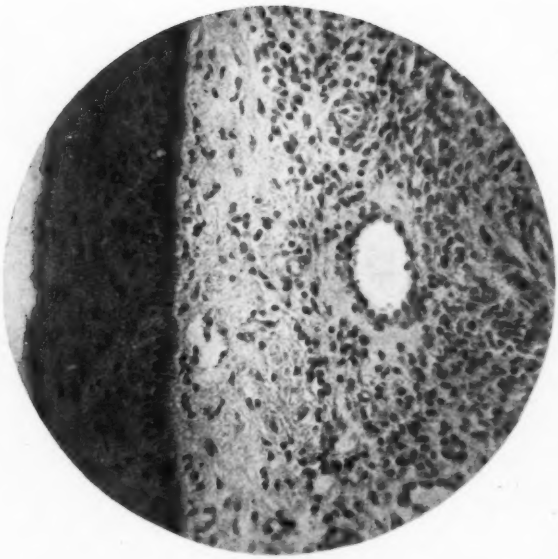

FIGURE 18.
Case 10. Hemo-angio-endothelioma. (Figure 10.)

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XXXVII.

THE OPERATIVE TREATMENT OF MALIGNANT TUMORS OF THE NOSE.*

By Prof. Dr. Alfred Denker,

ERLANGEN.

The treatment of malignant growths which develop in the cavities of the body is at this time exclusively surgical. Although we have been able to influence and cause to disappear, localized tumors situated on the surface of the body by means of the Röntgen and radium rays or by fulguration, we are still unable to use these in the treatment of the malignant growths which lie in the deeper parts. In spite of the energetic efforts to discover the etiology and pathogenesis of carcinoma, which have taken place in the last few years, the attempts along this line have led to no results which allow us to hope that the near future will see a non-operative specific treatment. The different carcinoma sera and other medicinal treatments are unfortunately so far to be designated only as slight advances in the therapy of malignant tumors. Even the arsenic treatment, which has been frequently recommended for sarcomatous tumors, leaves us usually in the lurch, although it has given good results in isolated cases, especially of lymphosarcoma. Although in the malignant nasal tumors which are usually of such bad prognosis it would be very desirable to have a specific therapy, for the present we have no such method at our command, and the possibility of cure rests upon a radical operation.

In the very earliest times the attempt was made to develop an operation for this purpose, and the number of methods in use has become a very great one. At this place I will mention only those methods which completely lay bare the origin and extent of the tumor and allow its thorough extirpation. For this reason I must refrain from discussing the methods of Hippocrates, Garengot, Wutzer, Rouge, Furneaux-Jordan,

*Paper read before the First International Congress of Laryngology and Rhinology in Vienna, 1908.

and Castex, which are confined to a splitting and reflection of the cartilaginous nasal framework and do not guarantee a complete view of the field of operation.

As preliminary operations for those tumors which grow out of the deeper parts of the nose or accessory sinuses, come next in consideration those extensive operations which are also used in malignant tumors of the upper jaw, the temporary or permanent resection of the upper maxilla. Both operations are extraordinarily bloody and one is accustomed, in order to overcome the danger of aspiration-pneumonia due to the excessive hemorrhage, to make use of the preventative tracheotomy with temponade of the air passages and even the ligation of the common or external carotid, and, as of late, the intubation of Kuhn. The total resection of the upper jaw, as first performed by Gensoul in 1827, has been, in regard to the incision, modified in many ways, especially by Velpeau, v. Langenbeck, Weber and Kocher, while the division of the zygoma, the union of the upper jaw with the nose and frontal bone, and the sawing through of the hard palate, on the whole, remains the same. The mortality in total resection of the upper jaw amounts to, according to Krönlein, 21.5 per cent, and, according to König, to 30 per cent.

The v. Langenbeck osteoplastic partial resection of the upper jaw, in which the incision passes through the soft parts of the cheek, exposes the base of the skull through a temporary laying back of the upper jaw with removal of the palatal plate and the alveolar process. There are numerous modifications, of which I wish here to mention only those which take their way through the mouth; one can differentiate by the latter an intermaxillary and a palatal route.

The palatal route was first used by Nelaton, who, after splitting the soft palate and cutting through the mucoperiosteum of the hard palate in the middle line with subsequent resection of the posterior two-thirds of the hard palate, attempted to penetrate into the deep parts of the nose and nasopharynx. In like manner Gussenbauer operates, elevating the mucoperiosteal covering of the hard palate after penetration in the midline to both sides as far as the alveolar process, and then removes the palatine process and the horizontal plate of the palate bone; that is, the floor of the nose and maxillary sinus. After removal of the tumor the two flaps which have been pushed aside are brought together with sutures.

The entrance made by the Nelaton-Gussenbauer method is, according to von Bergmann's opinion, not sufficient for those tumors of the nose and naso-pharynx which come down from the base of the skull. Those oral methods which consist of a temporary resection of the alveolar process in connection with the hard palate, allow of a more free laying bare of the field of operation.

As founder of this course, we must look to Chalot, who, in the year 1886, first performed this operation. Habs, who in 1898 employed the Chalot method for the extirpation of an angio-myxofibroma, which was growing from the base of the skull, describes the method, shortly, as follows: After severance of the cul-de-sac of the upper lip with the alveolar process between the two first molar teeth, the soft parts are elevated with an elevatorium as far as the spina nasalis anterior-inferior and to the floor of both nasal cavities. Then the mucous membrane of the floor of the nasal cavities is pierced with a pointed scalpel.

After introducing two Nelaton catheters into the mouth, through the nose, an end of a Gigli saw is attached to the end of each and the two are then drawn from the nose and the septum is sawed through, from behind forward, near the floor of the nose. Then the operation proceeds on the reclining head. After supporting the lower jaw by means of a Gutsch support, the hard palate is split inferiorly on both sides from the socket of the removed cuspid-tooth along the alveolar border to the attachment of the soft palate (profuse hemorrhage). Quickly the processus alveolaris between the alveoli of the cuspid teeth is separated from the nasal cavity, right and left, whereupon the entire hard palate, which is only held by the soft palate, can easily be depressed upon the tongue. After removal of the tumor mass the hard palate is replaced and fastened by silver sutures.

The method of temporary resection of the palate published by Partsch in 1898 differs from the procedure of Chalot principally in that with the palatal plate, not only the anterior part of the alveolar process, but the entire processus alveolaris is turned downward. It is performed in the following way: Transverse incision through the mucous membrane to the fold of transmission of the upper lip; retracting upwards of the soft parts; piercing the mucous membrane of the nose at the apertura piriformis; at the same time, chiseling with broad

chisels through the septum, the middle and facial walls of the maxillary antrum in a horizontal direction, over the floor of the nose and the antrum; turning back the entire hard palate with the alveolar process upon the tongue; after extirpation of the tumor, replace the palate in its normal position, and fix by suturing the mucous membrane. In 27 cases collected by Löwe and in part operated by himself after Partsch's method, the bones were united at the previous point of separation, although in part requiring a long time.

While Chalot and Partsch aim at the laying bare of the field of operation by means of the turning back of the palate, Kocher accomplishes the same end by separation of the horizontal parts of both upper maxillae by the intermaxillary path, He divides the upper lip by means of a perpendicular incision from the nasal aperture, running downwards, and then cuts through the fold of transmission of the upper lip to the bone. Corresponding to the last incision, which runs horizontal, the connection of the alveolar process and the hard palate with the facial and median walls of the antrum is cut through by means of broad chisels. If one then cuts through the hard palate and the alveolar process, in the midline, between the two superior central incisors, with a chisel or Gigli saw, both of the horizontal halves of the upper jaw may be forcibly pulled apart, and one obtains a good view of the nasal cavity and the naso-pharynx. After cleaning out the tumor mass, the union of the processi alveolares in the midline follows by means of metal suture, the hard and soft palates are then sutured, and the cleft in the lip is closed also by means of sutures. The cosmetic effect by the Kocher, as by the Chalot-Partsch, method is good; by both operations the hemorrhage, as a rule, is very great.

The nasal methods of laying bare the malignant tumors, in which, as already indicated, the operation involves not only the cartilaginous nose, but especially the bony nasal walls, can be divided, according to Kümmel, into those where the entire nose is cut and reflected, and those which require a temporary or permanent resection of the upper nasal region alone.

According to Linhart the nose is split along its posterior part, in the midline, the nasal bone and the processus nasalis of the upper jaw is detached by a chisel or a saw at the point of attachment to the frontal process, and thereupon the entire half of the nose is pulled aside without previous detach-

ment of the skin covering, while one causes a fracture in the region of the lachrymal bone.

By the method of von Chassaignac, carefully described by v. Bruns, the skin-periosteal incision is made from the inner canthus of the eye, in a circular direction over the ridge of the nose and its attachment, back to the ala nasi of the first side. The bony parts of the nose and the septum are cut through with a saw or chisel and then the entire nose is turned back to the opposite side.

According to the method recommended by Ollier, the nose remains attached to its lower line of insertion. The section runs on both sides from the root of the nose along the attachment of the outer nose to the line of attachment of the alae nasi. Section of the nasal bone, the processi nasales of the superior maxilla and of the septum in the plane of this incision by means of the saw, whereupon the nose usually may be turned downward without severing the cartilaginous portion. The cosmetic result in this operation is said to be not always very favorable.

Methods have been described by v. Langenbeck, G. Killian, A. Barth, Gussenbauer, Küster, Winckler and more recently by Moure and Brockaert which aim to lay bare the upper and posterior portions of the nose by means of a temporary or permanent resection of the nasal bone and the processus nasalis of the upper jaw. v. Langenbeck* made an incision from the middle of the glabella to the end of the nasal bones and from there along the apertura piriformis to the alae nasi. The skin flap thus outlined is dissected back, care being taken not to injure the periosteum; then the nasal bones are separated from each other near the septum, and the base of the processus nasalis is cut through with a saw deep into the orbit, from within outward. The os nasale and the processus nasalis of the superior maxilla, which remain joined to the mucous membrane and periosteum can be broken outward and later replaced.

G. Killian (and similarly A. Barth) makes a cutaneous incision in the median line from the glabella to the middle of the nasal ridge; after the periosteum has been retracted in the frontal region, the frontal sinus is opened, a probe inserted into its duct, and this is followed by detachment of the

*See Kümmel, Handbuch der praktischen Chirurgie, by v. Bergmann, v. Bruns and v. Mikulicz, Vol. I, p. 833.

nasal bone from the frontal bone without disturbing the skin in this region. The os nasale and the skin are turned outward and, finally, the portion of the nasal process which still remains is chiseled away from the frontal bone as far as the probe. Winckler goes still further to the side and turns the mucous membrane-periosteo-bone flap downward.

Inasmuch as the access to the ethmoid cells by this operation is a very small one, G. Killian, especially in connection with the radical operation on the frontal sinus, anticipates the laying bare of the whole ethmoid labyrinth with the permanent resection not only of the nasal bone, but also most of the processus nasalis of the superior maxilla.

According to the method of Gussenbauer, who lays bare the upper nasal segment on both sides, the incision runs from the middle of one eyebrow, along the orbital border, to the proc. nasal. max. sup., then straight across the nose, corresponding to the borders of the nasal bones, and finally on the other side, upwards in the same way. Both proc. nasal. max. sup. are cut through with a sharp chisel horizontally as far as the margo orbitalis, then frontally in continuity with the lachrymal bones, the lamina papyracea, the proc. nasal. frontalis, and finally the lamina perpendicularis ethmoidalis to their junction with the vomer. The whole flap of soft and bony tissues may now be turned upward. If, as Winckler proposes, a perpendicular incision is made on both sides at the ends of the incisions in the eyebrows, the anterior walls of both frontal sinuses may be temporarily resected in one piece, together with the above flap, and these sinuses opened at the same time.

According to the method of Küster, which is a modification of Chassaignac-v. Brun's operation, the cartilaginous nose is separated from the bony by a cross incision, the former is left in situ, the latter detached according to the Chassaignac-v. Brun method and turned to the side.

In the method published by Moure in 1902, a skin incision is made from the medial end of the eyebrow downward to the nasal opening, ending in the upper lip at the height of the insertion of the ala nasi. The soft parts are detached from the nasal bone and the nasal process of the upper jaw as far as the lachrymal bone, care being taken to prevent an injury to the cutaneous part of the ductus nasolacrimalis which would result in a fistula. A part of the nasal process of the upper jaw, a part of the lachrymal bone, the nasal bone, the spina

nasalis and the spina frontalis are resected. In this way a large access to the ethmoid is obtained, and it is possible to remove this in toto. After resection of the ethmoid, diseases in the region of the sphenoid can be attacked. After primary closure of the wound, only a slight depression at the inner canthus remains. (Abst. in *Internat. Centralbl. f. Laryngol.*, Vol. XIX, p. 327.)

In 1905, Brockaert extended Moure's method to the sphenoid cavity by detaching the periosteum from the facial wall of the upper jaw and reflected it with the soft part upward. After resection of the facial and medial walls of the sphenoid and the inner quarter of the orbital border, a tumor, a sphenoid endothelioma, could be easily removed. Union of the lips of the wound eight days later. (*La Presse Otolaryngol., Belge*, No. 3, 1905.)

Naturally, I have not been able to describe all the numerous combinations and modifications, but only the principal methods which are used in extirpating malignant nasal tumors. All the above methods, with the exception of the Chalot-Partsch, have in common that they cause a lesion of the continuity of skin of the face and result in a scar or a greater or less cosmetic defect. Most of them are very *bloody*, some, especially the Chalot-Partsch and the Kocher, are accompanied by an enormous hemorrhage, which, according to Kümmel, make a prophylactic tracheotomy and the introduction of a tampon-canula very advisable.

About two years ago, as most of my German colleagues are aware, I published a method which obviates the cutting of the skin of the face and materially lessens the hemorrhage, while still allowing the field of operation to be made completely visible. The method was an *oral* one, in which, after the bone had been laid bare subperiosteally, the whole facial and medial wall of the antrum as well as a part of the nasal bone and of the proc. nasalis of the superior maxilla were permanently resected. For the benefit of my non-German colleagues, I will here describe the operation in detail. It is based on the operation for old, chronic empyema of the antrum, which was described in the *Archiv. f. Laryngol.*, 1905, Vol. XVII, part 2, and is performed as follows:

Unless the administration of ether is contraindicated for other reasons, we use the morphine-ether narcosis (dose of morphine for adult usually 0.014). In addition, to reduce the

hemorrhage, a cocain-adrenalin tampon, in the form of strips of gauze, shoved as far back and up as possible into the nasal cavity, is recommended. Several strips of gauze leading out of the mouth are placed between the last teeth of the side to be operated, and the upper lip is drawn upwards and outwards by two blunt hooks. An incision is made through mucous membrane and periosteum down to the bone, which begins above the wisdom tooth, in the fold of transmission of the upper lip, runs forward, horizontal to the alveolar process, cuts through the frenulum labii superioris and extends 2-3 cm. further in the same direction over onto the other side. The soft parts are pushed upwards with the raspatorium and held by two four-pronged hooks until not only the superficies facialis maxillae superioris and the region of the apertura piriformis, but also the lower part of the nasal bone and the proc. nasal. max. sup. near the margin of the lower and inner orbital border are laid bare. Only when this has been thoroughly accomplished can a sufficient access to the ethmoid be obtained. This strong upward retraction of the soft parts occasionally tears the mucosa of the meatus at the apertura piriformis. The nervus infraorbitalis is drawn upward with the rest of the soft parts.

If by previous rhinoscopy it has been found that the tumor has not destroyed the medial antrum wall and grown into the antrum, before the antrum is opened, the mucosa, starting at the lateral margin of the apertura piriformis, is stripped from the lateral wall of the lower and middle meatus by means of a flat elevator which is about 6 mm. broad and has an end curved at an obtuse angle. This stripping, which must be done very carefully, so that no hemorrhage into the nasal cavity is caused by lesion of the mucous membrane, extends in adults from the apertura piriformis 4-5 cm. backwards to the posterior antral wall. If the lower turbinate still exists, it is cut off at the crista turbinalis with a pair of strong nasal scissors and a piece of gauze is inserted between the detached mucosa and the bone, in order to check the moderate hemorrhage.

During the opening of the antrum from the canine fossa, which now follows, it is important not to remove the subjacent mucosa with the bone, but, while taking care not to injure the former, to remove a piece of bone at least the size of a 10 pfennig piece by means of superficial chiseling and

slender bone forceps A premature hemorrhage into the antrum or nose is thus prevented. If the presenting and usually thickened mucosa is then excised, the resulting hemorrhage can easily be controlled by quick introduction of tampons. After the facial wall has been completely resected, the mucosa of the entire antrum with all of its recesses is carefully removed. This is necessary, since in most cases the antrum is involved in the process either by an extension of the tumor from the nose or by a chronic, purulent inflammation of the mucosa.

Next, the nasal wall of the antrum, with all of its processes, as far as the apertura piriformis, is completely removed with Luer's forceps and chiseling as far as the posterior wall of the cavity, so that the antrum is separated from the meatus only by the mucosa of the lateral nasal wall. At the same time, the lower part of the nasal bone and of proces. nasalis max. super. is resected in the neighborhood of the lachrymal bone.

So far, and this seems to me of the greatest importance, the entrance of large amounts of blood into the nasal cavity and from there through the choana into the remainder of the air passages has been prevented. If it is desired to prevent the downward flow of blood during the subsequent removal of the tumor, this can be accomplished by the introduction of a firm tampon into the naso-pharynx. Usually, however, at this point the patient is no longer in deep narcosis, so that we can with certainty count upon the presence of reflex swallowing of the blood and no longer need fear its aspiration. From now on, it is desirable to operate as quickly as possible. If the mucosa at the apertura piriformis has not been ruptured during the upward reflection of the soft parts, a puncture is made in the lateral nasal wall, at its anterior end, near the floor, a blunt-pointed knife of pair of scissors is introduced through the opening, and the whole wall is quickly excised and removed in toto. If the tumor springs from the middle meatus or the lower turbinal, it is removed for the most part with the mucosa. After the removal of the medial antral wall, the entire interior of the nose is broadly exposed, and it is an easy matter to cleanse the ethmoid thoroughly with conchotom and curette, and to lay bare the anterior wall of the sphenoid cavity completely and resect it. For this part of the operation, the use of artificial illumination by means of

the head-light or reflector is very desirable. A view is obtained of the naso-pharynx through the choana, and tumors of the pharyngeal vault can easily be attacked and thoroughly removed, especially if the posterior part of the septum is resected or pushed to one side.

The survey of the entire field of operation allows nothing further to be desired, as even entrance to the frontal sinus is easy after the anterior ethmoid cells have been removed. In the cases of extension of the malignant process to the sinus frontalis, it is urgently recommended that the anterior wall of this cavity be resected—incision through the eyebrow and retraction upwards of the soft part—in order to remove all diseased tissue.

After careful removal of all suspected soft and bony parts—whereby care in the region of the lamina cribrosa and lamina papyracea is demanded in order not to injure the dura or the periosteum of the orbit—the wound is tamponed with iodoform gauze and the oral mucosa sewed. Applications of Burrow's solution or boric acid solution are made to the operated side, and lavage of the mouth with boric acid solution. After 3-4 days, the tampons are removed through the meatus, and on the 4th or 5th day, the stitches are removed. After removal of the tampons, dermatol and, later, boric acid are insufflated. From the 10th day on, lavage with boric acid solution by the patient, by means of a wide, curved glass tube, until the secretion ceases. Covering of the wound is accomplished by granulations springing up from the bare bone, which are gradually epidermized from the nose. It should be noticed here, that permanent disturbances of the lachrymal apparatus, caused by resection of the greater portion of the ductus naso-lachrymalis, which occurs during removal of the lateral nasal wall, has never been observed.

Furthermore, loss of teeth in consequence of severing their nerves and vessels, never happens. However, it is better not to remove the facial antral wall up to the very bottom of the alveolus.

Altogether, I have used this method seven times for extirpation of tumors and twice have used it with very good results for the radical operation of very severe simultaneous empyema of the antrum, ethmoid and sphenoid.

As to the results of the seven operations for tumors, I may be allowed to report briefly here: The first five cases have al-

ready been published in the *Muensch. med. Woch.* (1906—No. 20), and in the *Archiv. für Laryng.* (Vol. XIX, part 3). Of these, Case 2 of my first publication is excluded from our discussion because it was a case of a nasopharyngeal fibroma arising from the fissura pterygopalatina for whose extirpation our operation is not suitable.

In Case 1 (Antone R., age 23), small-cell sarcoma, arising in the ethmoid labyrinth, there appeared, as already stated, a small recurrence after two months, which, since it hung down from the region of the nasopharynx, was removed with a galvano-cautery snare. The patient, who refused further treatment, and put himself in the hands of quacks, died about a year later, of the disease.

The second patient (John D., age 41), large epithelial carcinoma, which sprang from the middle meatus, and had destroyed not only the upper portion of the medial antral wall and a portion of the antral roof, but also the greater portion of the lamina papyracea of the ethmoid. I was able to present this patient a year and a half after the operation in my course for physicians, entirely free from recurrence and without any symptoms. Three months later, however, he returned with a recurrence located on the floor of the nose, which was removed after reopening of the oral opening. The course so far (3 months after second operation) has been favorable.

In the third case (Mrs. Marie D., age 65) there was an extensive endothelioma which had destroyed the facial and medial walls of the antrum and completely filled the nose and antrum, bulging the cheek forward. Furthermore, the bone of the alveolar process was already destroyed in its posterior half as well as that of the adjacent floor of the antrum. The tumor originated in the middle ethmoid cells. The case resulted in normal healing of the operation wound, and so far, one and three-quarter years later, there has been no recurrence.

Case 4 (Mrs. Emma Z., age 73), large, medullary carcinoma, which originated in the most posterior ethmoid cells and extended into all the accessory cavities and through the lamina cribrosa into the cranial cavity. Three days after the operation, she died of meningitis following injury to the dura during the removal of the tumor from the floor of the anterior cranial fossa.

Case 5 (Joseph F., age 32), spindle-cell sarcoma, which sprang from the lamina interna of the processus pterygoideus, penetrated into the ethmoid and sphenoid cells and filled the left nasal cavity from its floor to the lamina cribrosa of the ethmoid. Two months later there was a recurrence, which was operated five months after the first operation. In spite of thorough exenteration of the cavities, with removal of almost the entire lower and medial wall of the orbit, tumor masses soon reappeared. Treatment with arsenic and Roentgen rays had no effect. As a radical removal of the tumor was no longer considered possible, treatment was limited to palliative measures, such as the cautery snare and point.

Case 6 (Lina St., age 8), fibrosarcoma arising from the lamina cribrosa of the ethmoid, pushing the septum strongly to the other side and entirely filling the left nasal cavity. Here, too, the tumor recurred in two months. At the second operation, the medial and lower walls of the orbit, with the exception of a spur on the lower border of the orbit, were resected and the greater part of the posterior antral wall and the posterior part of the floor of the antrum were removed. Nevertheless, after scarcely two months, tumor masses again came down from the nasal roof. Strangely enough, the histologic examination of the tumor masses extirpated at the second operation and that of the *second recurrence* showed a change in the character of the tumor. Whereas the earlier examinations had resulted in the diagnosis of fibrosarcoma, the later ones gave the picture of a fibroma, in places rich in cells.

If the results of the above operation are examined as to their permanency, it will be seen that they are not especially brilliant. Only one of the six cases remains thus far (1¾ years) free from recurrence. Furthermore, in cases 2 and 6, the course after the second operation allows the possibility of a permanent cure. Also, it must be noted that in all of our patients the cases were far advanced and by their extent, their histologic characters, and their origins, made the prognosis very unfavorable. I may be permitted in this connection to cite Kümmel, who wrote on malignant tumors of the nose in the Handbuch f. Laryngologie and in the Handbuch du praktischen Chirurgie. He says: "The prognosis of sarcoma is absolutely dependent upon whether or not the tumor can be radically removed. If that is impossible, the prognosis

is entirely bad. If it is possible, the prognosis and results vary widely, according to the location, age, and histologic character of the tumor. The worst prognosis is in the case of *round-cell* sarcoma, especially the small-cell variety (Case 1), which are the most suspicious and recur with greatest frequency. The few cases in the literature which have been followed for a long time ended almost invariably in death, although it was frequently possible to give the patient relief for a long time by repeated operations. The spindle-cell sarcomata and the fibromata are as a rule less malignant, yet the writer had inoperable recurrences of these also" (Cases 5 and 6).

"In tumors arising from the roof of the nasal cavity, the prognosis is very grave on account of the danger of entrance into the cranial cavity" (Case 6).

"The tumors which, from any source whatever, have penetrated into the ethmoid can scarcely ever be removed by a radical enough operation." This was the case in all of our patients.

"The prognosis of nasal carcinoma (2 and 4) is much worse than of sarcoma. Most cases in literature have, it is true, been operated, yet not one seems to have had a definitely favorable outcome, although in certain ones death has been postponed for a long time (3¾ years, Schmiegelow)."

From these words of Kümmel it is evident that the prognosis of malignant nasal tumors, even with the very best of preliminary operations, is a very poor one. I do not need to state that I do not expect any great improvement of the prognosis by my method of operation. I do believe, however, that in this way there can be expected a diminution of the mortality from the operation itself, independent of the other advantages, which will be noted at the end of the article. First, however, I would like to discuss the articles in regard to the treatment of nasal tumors which have appeared since my publication of two years ago.

Two cases of endothelioma were operated according to our method, in 1907, in the Strassburg Ear Clinic, and have been described by Althoff in the *Archiv. f. Larying.*, Vol. XIX. part 2. The director of the clinic, Prof. Manasse, told me that my method had given him very good service, that the view of the

antrum, ethmoid labyrinth and sphenoid sinus had been a very good one, and that in this way these cavities could be very well cleaned out.

Prof. Neumayer, Munich, operated an ethmoidal sarcoma, a carcinoma and a severe tuberculosis of the nasal meatus by our method and was *very well satisfied by the view which this method gave of the origin and extent of the disease processes.*

In June, 1907, Delie reported in the Jahresversammlung der belgischen oto-rhino-laryngologschen Gesellschaft a case of carcinoma of the lower turbinal which he operated in almost exactly the way I have described, with the best results.

In the *Monatschrift f. Ohrenheilk.*, 1907, Vol. IX, Schoetz reported a case of carcinoma of the antrum, from Kümmel's clinic in Heidelberg, where our method of operation was followed. The patient could be discharged for ambulant treatment 10 days after the operation. Schoetz states that "the good cosmetic results and the quick cure would make this method the typical operation in the future."

In the second part of his work, "Zur Chirurgie der Nase," published last year, Löwe published a method of laying bare the ethmo-sphenoid region from the mouth, to which he came independently of me. This method almost completely corresponds with mine, differing only by the fact that Löwe, in order to uncover the cells lying in front of the ductus nasofrontalis, temporarily reflects the lower part of the nasal bone upwards, whereas I resect it. That the permanent removal of the lower third of the os nasi causes no deformity may be seen from this photograph.

In an article which has recently appeared in the *Archiv. für Laryngologie,* Uffenorde, while describing the methods of operating on the accessory cavities, stated that my method had great advantages in tumors of the antrum and tuberculosis of the medial wall, whereas in affections of the ethmoid, access to the anterior ethmoid cells was very difficult, and even impossible. This, however, is the case only when the soft parts have not been retracted upwards sufficiently, and the lower part of the nasal bone and the proc. nasal. max. super. have not been removed. I admit that I did not emphasize this part of my operation in my first publication, and am convinced that

Uffenorde would modify his opinion as to the view of the field if he resected these bony parts, in suitable cases.

To you, however, who are present, I hope to convince directly by demonstrating the view of the field of operation on a specimen which shows my method. (Demonstration.)

In conclusion, I desire to summarize the advantages of my method over the extensive preliminary operations used heretofore.

I. My method allows as well as any nasal, facial or oral method a wide and accessible laying bare of the origin and extent of tumors in the nose and accessory sinuses. Accordingly, it fulfills the condition of permitting the thorough exenteration of the tumor.

II. There is no cutting of the external skin, such as is found in all nasal and facial methods. Since the removal of the bony portion causes no deformity, the cosmetic result is an ideal one.

III. The downward flow of large quantities of blood is almost certainly prevented by our method. This makes it preferable to the very bloody operations of Chalot, Partsch and Kocher, which, on the other hand, have very good cosmetic results. As a result of the lessened danger of aspiration pneumonia, our method obviates the prophylactic ligation of the carotid and the preliminary tracheotomy. The mortality from the operation itself is very small.

IV. The after-treatment is exceedingly simple, the healing usually normal. As a rule, the patient can be discharged from hospital treatment in 10-14 days after the operation.

For these reasons, I think I am justified in warmly recommending my method for nasal tumors, and requesting you to test it.

XXXVIII.

CYSTS, ABSCESSES, AND EDEMA OF THE EPIGLOTTIS.*

By Henry L. Swain, M. D.,

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NEW HAVEN.

Swelling of the epiglottis, occurring suddenly and independently of any of the more chronic and systemic conditions, such as syphilis and tuberculosis, is apparently due to a number of causes, and three peculiar instances having come to my notice with this condition at about the same time, I was led to give the matter enough thought to look over my own records and to find out the opinions of others as to the origin and causation of such cases. The results of this consideration I venture to present to you under the above title.

Two patients with enlargement of the epiglottis came to me, in whom there was a history of previous attacks similar to the one in which I first saw the patient, and each of the attacks was apparently not connected with any previous inflammation of the tonsils or other parts of the throat.

In 1895 I was consulted by Mr. L. C., 46 years old. He had had difficulty in swallowing for at least two years. At all times there was a sense of fullness in the throat. Frequently the difficulty in swallowing solids was very great. Rarely until the present time had he had any actual pain. He had suffered in the past from frequent attacks of tonsillitis, which have presented no other difficulties than is usually the case with tonsillar inflammations. Examination showed him to have simple enlargement of both faucial tonsils. In the lower part of the throat the laryngoscope discovered a large swelling, a little to the right of the median line, on the lingual surface of the epiglottis, pressing it so far backward toward

*Read at the thirtieth meeting of the American Laryngological Association held in Montreal, May 11 to 13, 1908.

the posterior pharyngeal wall as to completely conceal any view of the interior of the larynx. The surface of the swelling was red, and it was evident from appearances that we had to do with a cyst, which was in a state of inflammation. Under simple local anesthesia a large slit was made in the wall of the cyst and a very thick, gelatinous, greenish colored fluid was evacuated. The sac seemed to be fairly thick-walled, but on seeing the patient five days later the cyst had, however, so contracted that it was impossible to get into it again. My idea had been to cauterize the lining membrane of the sac.

Nothing more was heard of the patient until January, 1896, some three months later. The sac had filled up again, to a small extent. Puncture was made, and a bead of nitrate of silver on a probe was passed down through the opening into the interior of the sac.

In October, 1898, the patient again presented himself with a large swelling in the same location, this time weighing down the epiglottis to such an extent that there was considerable difficulty in breathing, and severe choking when liquids were swallowed in large amount. Considerably more pain and constitutional symptoms were also present at this time than in the previous attacks. A liberal slit was made rapidly into the superior wall of the sac, and a large amount of mucus, with more pus in it than before, was evacuated. The collapse of the sac was so complete, owing to the gagging of the patient, that it was impossible for me to get into the opening again with a probe in order to cauterize the interior. Examination a month later showed no evidence of any cyst wall remaining.

The patient reports at the present writing that he has had no trouble from a recurrence of any inflammation in the sac, and he attributes his immunity for these years to the fact that he had his tonsils cauterized. As none of his attacks of enlargement of the cyst have followed tonsillitis, directly or indirectly, I do not take his suggestion seriously as regards the reason of his immunity.

The second case of abscess formation in the epiglottis, of the recurrent type, and of cystic origin, occurred in a young man, about 26 years of age, who was first seen by me in 1894. He was then recovering from what he now supposes to have been abscess in the region of his epiglottis. His history at the time of his first appearance was that he had had "an

awfully sore throat," which he considered to be quinsy, that it had broken in the night, and, that as he had had two previous attacks of it, one in 1890 and one in 1892, he wished me to advise him as to some method of relieving him of such recurrences in the future. He was then a student in the University, and I saw him a number of times, but as his tonsils were not very large, did nothing for him further than the ordinary treatment for the catarrhal condition which existed in his nose and throat. At that time the existence of a cyst in his epiglottic region was not known to us. He had an interval of immunity of about eight years, during which time he had so much cough and bronchial trouble that he thought that he was about to become a victim of tuberculosis, and passed his time in a warmer climate, being principally engaged, in one way or another, in business in the southern states.

In 1904 he came to me with exactly similar symptoms and conditions as depicted in case 1. A large cyst or abscess cavity was found at the base of the epiglottis a little to the left of the center, which drove the epiglottis downwards and backwards over the entrance to the larynx. He was in the greatest possible distress when he came to me, having been in this condition for three or four days, and having sought relief at the hands of various physicians, all of whom, however, had failed to use the laryngoscope. Immediate relief was given by puncture and evacuation of the cyst, and the same glairy, thick, yellow mucus in large mass, mixed with small flocculi of pus was evacuated, as in case 1. There were so much blood and discharge, that it was impossible to do anything toward further opening of the sac or cauterizing its interior that night. The patient failed to come back until the third day, when the epiglottis had so righted itself and the parts had so shrunken, that it was impossible to get a probe into the opening as one would have expected, had there existed a large cyst cavity.

His description of his feelings and symptoms in the three previous attacks left but little room to doubt that he had had a similar state of affairs, with spontaneous rupture of the sac.

A three year interval elapsed, and in August of last year he again had a sudden attack of violent pain and swelling and choking, following the use of his voice in a lecture. He had had absolutely no previous inflammation in his throat nor any

cold. He was then in a distant part of the country, and the sac was opened by a skilled hand, and an attempt was made to curette the interior of the sac, which resulted in an enormous amount of swelling and discomfort, and the thickening went down very slowly, not having entirely subsided a month thereafter.

He had another attack in December last, coming on in exactly the same way as before, and it was again opened, this time, however, by simple incision. The sac collasped completely, and since that time it is impossible to see any evidence other than that of the scar, which is situated at the base of the epiglottis, entirely off from the base of the tongue.

He reports that his mother and two sisters have had abscesses in their throats, which on two different occasions have been diagnosticated as being somewhere at the root of the tongue. None of these patients was ever examined with the laryngoscope.

These two cases, it seems to me, are to be diagnosticated carefully from those of abscess of the lingual tonsil, which cases of lingual quinsy are like the faucial type in that they are more or less peritonsillar and do not as a rule involve the epiglottis at all, except as the latter becomes edematous. Of the abscesses in this region which I have seen, and which number only five, three were on the left side of the base ot the tongue, just at the entrance of the pyriform sinus. At least that is the region in which the greatest swelling occurred and where I made the incision to evacuate the contents. This means, of course, just beyond the lymphoid tissue of that region. The other two cases were nearly central, a little to the right, in the fossae glossoepiglotticae, at the root of the tongue. These five cases were all subsequent to well developed acute follicular inflammation of the lingual tonsil. The two cystic cases, first mentioned, were so situated as to be clearly of epiglottic origin. The fact of the recurrences and the character of the contents in both cases, not being simply pus, but thick, glairy, greenish mucus, have led me to the conclusion that they must be cysts of the branchial cleft type. I am more impressed that this is the explanation, because of the character of the matter contained in the cysts which was exactly similar to that which I once saw in a recurring cyst which opened externally in the neck in the thyrohyoid space.

This was a most interesting case of this type, and was where we could study it more carefully than when occurring within the throat. It was in a girl of about 20 years. When I first saw the patient it had been opened frequently, evacuated, and washed out with various solutions, all to no effect, for in a shorter or longer time, the secreting mucous membrane not being destroyed, it would again fill up. When I opened and carefully probed the cavity, it went down to within so short a distance of the interior of the larynx that the separating membrane was apparently as thin as thin note paper. That this was the case was definitely demonstrated when a surgeon, rather against the advice of the laryngologist, attempted to dissect the sac out under general anesthesia. Notwithstanding that the membrane was well defined, it was impossible to loosen and remove it over a circular area of about 3/16 of an inch in diameter because of the fear of producing a fistula by opening into the interior of the larynx at the base of the epiglottis. The unremoved area of mucous membrane was lightly touched with a pure stick of silver nitrate, and the edges of the wound sewed up. For some years there was no return, and the case has passed entirely from my knowledge.

As is well known to all, in the depths of the branchial clefts of the embryo, the epiblast and hypoblast, as seen in serial section under the microscope, are separated by the merest network of a single layer of intervening fibres. Whether the inclusion cyst comes on the one side of this partition or on the other is probably purely accidental, but when, after the habit of these cysts, after years of quiescence something starts them to secretion, in the one instance it will be external and in the other at the base of the epiglottis. The clinical phenomenon is the same in both cases. Dermoid cysts and supernumerary thyroid glands are also recorded as occurring in the region which we have under consideration, so that our cases of branchial cysts fit in with the universal experience. How small these cysts may have been in the quiescent period one does not know. When inflammation starts, as in the two cases which I report, the sac becomes as large as a small English walnut. It should be remembered that on several occasions in both cases the attack came on suddenly and a large amount of pus was evacuated, making it appear that the infection had taken place in an already large cystic cavity. In these in-

stances there seemed to have been no previous inflammation in the throat, at least none of which the patient was conscious until the feeling of discomfort resulting from the swelling of the cyst and the distortion of the epiglottis came to pass.

The foregoing explanation for these cases seems to be fairly clear, and the indications for treatment are evident and plain, the only trouble being in the difficulty of destroying the lining membrane of the sac at the time of the first incision.

During the last year three patients with simple, what might be called, "idiopathic." edema of the epiglottis came to my attention, which also were not connected with previous inflammatory action in the tonsils or throat. Two ended with distinct abscess of the epiglottis, and the third, between a morning and an evening visit was so much improved, during a nap which the patient had taken in the middle of the afternoon, as to lead one to the only probable supposition that perhaps also here a small abscess had broken. The histories are very briefly as follows:

A student of the University came in to me one evening complaining of a swollen and tight feeling in the lower part of his throat, with difficulty in swallowing. It had come on during the last two days, being very much worse today. He had had no previous sore throat or cold. Examination of his throat showed the left side of his pharynx somewhat congested, no active tonsillitis in evidence, but an enormously swollen epiglottis with a greater prominence on the right half, on its lingual side. As there was no marked swelling of the aryepiglottic fold or the arytenoid cartilages, the condition did not seem to me to be urgent and I did not make any punctures, simply spraying the throat and ordering a steam atomizer, with Seiler tablet solution, and adrenalin every two hours through the night. He came next day with a distinct white point on the more swollen right side of his epiglottis, which on puncture developed a cavity as large as an orange seed. This evacuated itself, with complete collapse of the walls. The swelling promptly went down in two or three days, and he made an uninterrupted recovery.

This case was scarcely off my hands when I was called to treat an elderly woman whom I had known professionally for a good many years. I had seen her throat at various times, and had been particularly conversant with the base of

the tongue, for she had had enlargement of the lingual tonsil which frequently produced cough. She sent for me one day with the statement that she had a sore throat in a different position than ever before, and that it was exceedingly distressing to her, and that she had a queer suffocating feeling that was very disturbing. Examination showed an epiglottis very similar to the one I had seen a few days before with the exception that there was more swelling on the left side than on the right, and that the aryepiglottic fold around to the arytenoid was very considerably swollen. Here the indications were certainly for more active treatment, and paying but little attention to the epiglottis, I punctured the aryepiglottic fold, and was gratified to find that in a few hours the swelling went down in response to the puncture and the steam atomizer, used as in the other case. The next day a white point was seen upon the most swollen portion of the epiglottis, and on the following day it was punctured, with the evacuation of a considerable amount of pus, with a quick subsidence of the symptoms. In this instance I was able to put a pledget of cotton dipped in strong carbolic acid directly into the cavity itself. There had been to my certain knowledge in this patient, as I had seen her within a few days of the time she called me to the house, no active inflammation in the throat such as one would usually expect to find in an edema case.

At a time not very distant from these two cases, I was called suddenly in the night to a patient who, being a physician, diagnosticated his own case. He said he believed he was having edema of the glottis. He had been having leptothrix of both tonsils, and had had considerable irritation in this region from the foreign organism. During the twenty-four hours previous to his calling me his throat had been a little sorer than usual and a different sort of soreness than he had been having during any of the time. I found a well-swollen epiglottis, with the aryepiglottic fold on the left side also markedly swollen back on the arytenoid itself. The swelling was of the very baggy type on the epiglottis, but not so deeper down, so that I felt no alarm that the patient would immediately be troubled for breath, but nevertheless, I made multipuncture and started the steam atomizer. The patient was very uncomfortable and had a good deal of pain

and trouble during that entire day. The next morning the swelling had gone over decidely on to the other aryepiglottic fold. No evidence of any pointing as of abscess in the epiglottis was seen although it remained distinctly swollen. From the morning of the second day the patient began to take moderate doses of salicylic acid and oil of wintergreen. He had a nap in the afternoon, from which he awoke very much relieved, and to my great surprise, when I examined him, the swelling had disappeared by more than half in all the parts that were affected, and I have felt fairly positive that there must have been some small abscess which had ruptured, which had been so situated that I was unable to see it.

The explanation of the first two cases in this group was rather difficult. The third and last may be said to be due to the leptothrix of the tonsils or to the gout, owing to the sudden improvement after taking the salicylates. The simplest explanation to give of the phenomena in the first two cases is that we had perichondritis with edema and the formation of a focus of pus. In both, the pus formation was spontaneous and not the result of any infected wound of the particular region where the abscess occurred, for no punctures were made in that area.

Concerning the probability of such a perichondritis, I was interested to run through such literature as I happened to have at hand, with the following results: D. Braden Kyle speaks of an acute epiglottiditis as occurring, and that it might sometimes be of a malarial or miasmatic origin. This last was referred to by several other authors, among them being Shurley of Detroit, and at considerable length by Arnold of San Francisco, in Burnett's first System. Newcomb, in the textbook, "Burnett, Ingals and Newcomb," speaks of abscesses probably occurring but very rarely. Casselberry, in Buck's Handbook, appears to have seen just such cases as those described in this last group, mentioning very similar conditions. When the abscess occurs on the lingual side of the epiglottis, he speaks of the inflamed condition as causing much dyspnea, but no great amount of dysphagia. Morell Mackenzie, who saw about everything that was ever observed, mentions abscess of the epiglottis as sometimes occurring.

Some of these authors speak of the matter under the general head of perichondritis of the cartilages of the larynx;

others under the head of affections of the epiglottis. Lennox-Browne said he had never seen a case of pure and simple perichondritis of the epiglottis, and mentions the fact that the fibroelastic cartilage with no very well developed perichondrium is not such as would be conducive to the production of perichondritis.

Unless we arbitrarily presuppose that a quiescent cyst was present in these two cases of pure abscess formation, and that the condition resulted in edema and pus formation, we are obliged to come back to one or two suppositions as regards their formation; either a perichondritis or an epiglottiditis. Neither of these two patients had ever had an attack of sore throat which could possibly be construed as being the same as the one described, and the existence of old branchial cysts cannot be considered.

Incidentally, a small retention cyst from the stopping of some mucous gland could be the origin of the trouble as we so often see it in an anatomically similarly constructed part of the body, viz., the eyelid, when a stye forms. In stye-formation we often have a simple Meibomian cyst existing for a long time previous to infection, and then we have what is usually called the stye, with the formation of pus following the infection. The analogy is very good here, and I have never seen a case of chondritis of the lid except from infection after an injury or infection of these cysts. It would only remain, then, to know how often these simple retention cysts of small diameter occur to make the picture complete. These, however, have never been reported. I have looked rather diligently for them since the idea occurred to me, and I have not found them as yet, but these edema cases with abscess are also very rare, these three being the only ones I have ever seen in twenty-three years' experience. So that we may very reasonably assume that one would not often find the stopped-up mucous glands which we are supposing to exist as a preliminary to the formation of abscess. Furthermore, racemose mucous glands are not numerous on the lingual surface of the epiglottis. Not giving credence to this explanation, we are driven back to the condition of idiopathic inflammation of the epiglottis, a very difficult thing to understand in these cases where no previous inflammation has existed, and yet is the one adopted by numerous writers. Ballenger in his recent

book gives a separate heading, "Acute infectious epiglottitis," giving Theisen credit for the term. The latter's admirable paper had escaped us. Both these observers would evidently class such cases as the three under consideration in this group.

These three cases also differ very markedly in my observation from certain others where the edema for example, follows a simple tonsillitis. Difficulty in swallowing is the first symptom. Take for example a certain student in whom, following the mumps with a sore throat, there developed a very marked swelling and edema of the left arytenoid and aryepiglottic fold. The edema was of the baggy type, and fell over into the larynx on inspiration so that it entirely covered over the false and true vocal cords. Multiple puncture and the steam atomizer again proved of the utmost relief and speedily reduced the swelling on this side, but the next day it appeared on the other, and remained there with the greatest persistence and in very threatening amount for two whole days, when it yielded to treatment and promptly recovered.

I have had a similar experience in perhaps ten other cases where the edema followed previous inflammation in other parts of the throat and was not associated with any real perichondritis of the adjoining cartilages or inflammation of the cricoarytenoid joint. In every case it did not affect the opposite side, as in the instance related, but usually did, although only once were both sides simultaneously attacked. In these cases we have apparently a simple inflammatory affection of the mucous membrane with edema, exactly as we see it sometimes in the uvula and soft palate, with no false membrane and no other manifestations.

At present writing there seems to be good explanation for this phenomena, or for the spreading and more or less self-limitation of the inflammation. I have thought that in most of these fugacious cases there was some connection with the grippe, but was only twice able to positively connect the two. Three of the ten were certainly at a time of the year when grippe was neither prevalent nor at all probable.

No abscess formation in the arytenoid region has been noticed in my cases, except in that form of genuine perichondritis which follows severe scarlet or typhoid fever. In one instance of typhoid perichondritis there resulted the exfoliation of a small piece of an arytenoid cartilage, and in another

the whole cricoid was involved and became necrotic. The one case caused complete immobility of one arytenoid, with fixation of it near the median line. The other case produced the same fixation in the median line of both chords as might have resulted from a pure and simple paralysis of the crico-arytenoideus posticus muscles. Both cords being in the median position, it was necessary to do an immediate tracheotomy. These cases belong to a very different group from the fugacious type, which latter, while they may be exceedingly threatening at the time, seldom leave any complications. One has to act quickly and rapidly in the premises, but the ultimate outcome is good. Also we have to distinguish again edema of the glottis as it occurs as a result of some systemic condition such as disease of the kidney or pupura hemorrhagica.

I have seen one such case of what one might call general edema of the glottis such as is shown in Gruenwald's Atlas as published by Saunders. This edema involved, as is shown in the picture, not only epiglottis and glottis and the interior of the larynx, but also the upper part of the trachea. In the case shown, as in my own, no operation was of any avail.

To recapitulate, then, we certainly have several distinct types of inflammation; the branchial cysts, with recurrent enlargement, edema of the epiglottis with abscess formation due perhaps to small inclusion glandular cysts or to be classed as acute infectious epiglottiditis, and then the fugitive edema of the simple or local type following inflammation in the throat, which latter is not to be confused with the two types which result from pure perichondritis, as after typhoid fever, and from the firm swelling with slight edema with which we are all so familiar as it occurs in tuberculosis and syphilis, these are all to be distinguished from the general edema resulting from systemic causes and burns or other traumata.

XXXIX.

SOME INTERESTING CASES OF DISEASES OF THE ALVEOLAR PROCESS.

By W. H. Haskin, M. D.,

NEW YORK.

Scarcely a day passes in the practice of our special work that each of us does not see new patients, each presenting some point of interest, but I think that the following are a bit out of the nose and throat area, as ordinarily practiced by us, and may prove interesting.

They were all referred to me for treatment by their dentists, who had been students of mine at the College of Oral and Dental Surgery. The question arises whether we should not enlarge our sphere of usefulness and give these sufferers the benefit of trained surgical skill rather than allow them to remain in the hands of their family dentist who, generally speaking, is not properly qualified to take care of them.

The results to the patients in the following cases were all most beneficial, but I feel that the chief good has been derived from the practical demonstration to their dentists of the foolhardiness of attempting to treat these cases through the root canals in some, of not resorting to surgical methods in all, and of the results of not being honest with them when extracting. I will give brief histories of twelve cases that have been treated by me, some of which resemble those reported by Dr. Robt. Levy, before the 1907 meeting of the American R. L. & O. Society in his paper on "Tuberculosis of the Mouth."

Case 1: Miss B. A., age 25, a teacher, was brought to me by Dr. Mayer, on May 15th, 1907. Her general health was always good. Four years before the lower left first molar had been filled with amalgam, the root canals being devitalized and filled. Since then she had never suffered any pain, but four months ago she noticed a gum boil pointing just below the gingival margin on the labial surface of the alveolar process, which broke of itself and did not cause any pain. This recurred several times until one month ago when she called upon Dr. Mayer. He removed all the root canal fillings and found

that one of them communicated with the fistulous tract and then brought her to me. With a probe I found a large cavity in the process and evidence of carious bone. Under subperiosteal injection of a one per cent solution of cocain and 1:2000 solution of adrenalin chlorid I uncovered the bone at the fistula and removed all carious bone, completely exposing the two labial roots which were found surrounded by granulations. The cavity was then packed tightly with iodoform gauze, and Dr. Mayer was instructed to carefully fill the canals to their apices which were visible. He then took charge of the case and has reported an excellent result, the wound having filled in well, leaving only a slight depression.

CASE II: S. J. B., age 29, a lawyer, was brought by Dr. B. B. Machat on April 10th, 1907. The family history was tubercular, and the patient looked as though he also was a victim of that dread disease, being very thin and pale, appearing decidedly septic. For two years he had suffered with recurring attacks of pain, swelling and offensive discharge from the left upper alveolus over the canine socket, this tooth having been removed after an acute abscess about three years before. Dr. M. noticed a fistulous tract and treated it with syringing, but as it did not improve he brought the patient to me. A probe revealed a deep fistulous tract, full of granulations and areas of carious bone extending in several directions. On April 11th I operated upon the patient at the Manhattan Eye and Ear Hospital, under ether anesthesia. Here I found very extensive destruction, the caries reaching the floor of the nose and antrum and involving the whole thickness of the alveolus for at least three-quarters of an inch, necessitating the removal of the bicuspid. As there was no trouble in the antrum I carefully avoided opening into it. The wound was packed with iodoform gauze, as usual, it being allowed to remain for two days. After the second dressing I sent him to Dr. Machat for further treatment. December 14th, 1907, the doctor reported that the wound had healed rapidly, that the patient's general health had improved greatly and that a special bridge covered the depression in the alveolus.

CASE III: Mrs. M. F., age 59, was referred to me by Dr. A. Tepper, for severe pain in the upper jaw of many years' duration. Twelve years before she had had four teeth removed by a Dr. Koontz, the other twenty-eight having been

removed twenty years ago, when she resided in Germany, although her husband declared that they were sound. Until one year ago she had been comparatively free from pain, but since then it had been almost intolerable and had caused her to lose much flesh, and her husband feared insanity from the insomnia. Examination of the mouth revealed a minute fistulous opening over the left lateral incisor socket which led into an extensive pocket with evidence of caries, and the whole alveolar process was much thickened in that region. Under cocain and adrenalin anesthesia I uncovered the fistulous area and removed considerable carious bone. Here, however, I found the edge of a tooth and immediately took her to Dr. Hasbrouck, who succeeded in extracting a perfect, unerupted incisor tooth, which must have extended into the nasal process, it being three-quarters of an inch long. October 20th, 1905, the patient reported by letter that all her distress had disappeared and that she was able to wear her plate with perfect comfort. This case, presenting an unerupted tooth at the fifty-ninth year, was, to me, a most interesting case and would easily have been diagnosed had the x-ray been used.

CASE IV: Mrs. M. H., age 35, was brought to me on November 1st, 1904, by Dr. S. Goldstein. The patient was very anemic, thin and septic in appearance and gave a family history of tuberculosis, although she had no symptoms of the disease in her own lungs. Two years before the upper right first molar was destroyed by caries leaving the roots. Since then she had always had more or less trouble, but never much pain until two months ago when a doctor lanced a painless gum boil. Since then the face had been swollen and there had been a constant discharge of foul smelling pus in the mouth. On examination I found the whole side of the face swollen and edematous, the right superior alveolus badly diseased, full of roots and discharging pus from just above the gingival border of the first molar root where it had been lanced. A probe revealed caries in the fistula and around the roots of several of the teeth. Under hypodermic injection of cocain and adrenalin I removed all the roots and found a large opening into the antrum at the first molar socket, surrounded by carious bone and granulation tissue. There were three distinct areas of caries at other points, all of which were thoroughly curetted. After removing the caries around the antral fistula

I could introduce my finger into the cavity, and finding it free of granulations I did nothing with it, but packed the three carious areas and the antrum with iodoform gauze. I treated the patient for two weeks and then, all swelling having disappeared and there being no discharge from the antrum, I returned the patient to Dr. Goldstein, with an antral drainage tube held in place by the packing. Dr. G. reported at intervals for three months, at the end of which time the patient was entirely well and was wearing a full upper indenture with much comfort.

CASE V: A. M., male, age 46, was brought to me by Dr. W. H. de Groot on April 11th, 1906. The patient had been suffering intense pain for over a month and had had his right upper bicuspid and first molar extracted for relief, but without benefit. He then changed his dentist, and Dr. de Groot immediately brought him to me for consultation. The patient gave a history of a long standing point of discharge over the right upper bicuspid, but had had no pain until a month ago. At that time the cheek became swollen and he had intense pain which was supposed to be due to ulceration of the root of the bicuspid, and it was extracted but gave no relief. The first molar was then extracted, but again gave no relief. On examination I found the sockets of the two teeth filled with granulations, extensive caries and a large opening into the antrum through the molar socket. After removing all the diseased tissue, as I supposed, the antrum was packed with iodoform gauze. Much to my surprise, the pain was not relieved, although the wound was clean and began to heal nicely. At the end of a week I sent the patient to Dr. Sinclair Tousey, who made an x-ray negative of the alveolus for me, which disclosed, very beautifully, a pus sac involving the inner root of the second molar on the posterior border of the wound. This was easily reached, and on being opened and curetted gave instand relief. I had Dr. de Groot extract the pulp from that root and fill it. On June 4th, 1906, he reported the patient well, except for a very small opening into the antrum, which was closed by a close-fitting bridge. As there was no discharge or inconvenience caused by its presence I recommended leaving it alone.

CASE VI. F. A. S., male, age 51, a resident of Syracuse, was referred to me by Dr. Demarest. He gave a history of

toothache, followed by a gum boil, three months before and persistent pain ever since with a very offensive purulent discharge from the left nares. In July he had had his antrum punctured through the alveolus and had been compelled to wash it daily to overcome the offensive discharge. On examination I found the alveolar opening surrounded by granulations and carious bone, and advised operation, but as he wished to return to his home in Syracuse I referred him to Dr. Halstead and have not heard from him again. This was undoubtedly an antrum suppuration prolonged by the carious bone at the alveolar opening, and would have been easily cured by its thorough removal of the caries.

CASE VII. J. B., male, age 46, a blacksmith and a resident of Sidney, N. Y., was brought to me by his dentist, Dr. A. P. Clarke, on October 23rd, 1904. Nine months before he had had the left lower second molar extracted, although it was sound, to try and obtain relief from pain apparently located at that point (the first molar had been extracted some months before that). Following this the cheek became swollen, and he had had a partial facial paralysis for a few months. Some time later a swelling appeared under the lower jaw, which broke under the tongue and gave no further trouble. Ever since then there had been a hard, painful mass on the jaw, which at times discharged pus and was gradually increasing in size. The pain had grown more and more intense, causing loss of sleep and much interference with mastication. On examination I found a very hard tumor, about the size of a large hazel nut, with a minute fistulous tract leading down to exposed carious bone, and I advised operation. He was anxious to return home and insisted upon immediate action, so under hypodermic of cocain and adrenalin I uncovered the mass, which appeared to be a dense osteoma, and removed it with chisel and bur. As I was smoothing the cavity with the bur, thinking that all trouble had been removed, the instrument struck a harder mass, which proved to be a broken root of the first molar. This had probably been the cause of all the pain, and would have been disclosed in an x-ray plate, and thus have saved the sound second molar, removed as a possible cause of the pain. Dr. Clarke took full charge of the patient at his home, and three months later reported that he

had made a rapid recovery and had been entirely free from pain from the time of the operation.

CASE VIII. Miss J. C. B., stenographer, of N. Y. C., came to me on June 9th, 1905. She was about to have a new full upper indenture made, but her dentist was afraid that it would not be a success, because of an irregular thickening of the alveolus on the left side at the site of the former canine and bicuspid teeth, it being also somewhat tender on pressure. At first sight I did not notice anything save a pin head depression on the labial surface of the thickened alveolus, but on using a Buck's ear probe with some pressure, I found that there was a fistulous tract filled with granulations and that there was carious bone present, although she insisted that there had been no discharge at any time. Under cocain and adrenalin hypodermic anesthesia I uncovered the area and was rather surprised in finding extensive caries involving the whole thickness of the alveolus and extending to the floor of the antrum. The cavity healed rapidly with iodoform packing changed daily, and at the end of a month she was able to be fitted with her new indenture, which she has worn with comfort ever since.

CASE IX. Mrs. B., age 40, of N. Y. C., came to me in January, 1908. Her general health was good, but for over a year she had had a small fistula over the socket of the right upper canine, which had been extracted, from which she could always suck out an offensive pus, but it was never painful. The tooth had been extracted and the fistula treated by her dentist, but it had never closed. A probe revealed carious bone and a tract three-quarters of an inch in depth. Under local anesthesia by hypodermic I uncovered the tract and with bur and chisel removed all the diseased tissue, packing it with iodoform gauze, as usual. At the end of five weeks there still remained a small area of exposed bone, which I pared down with the bur, and the wound then closed completely and has given no trouble since.

CASE X. C. P., male, age 47, a printer, was referred to me by his dentist, Dr. A. Tepper, on June 4th, 1907. He complained of intense stabbing pain in the left upper alveolus, and had had all his upper teeth extracted, but without any relief, the pain steadily increasing. As I was leaving the city two days later, I told him that I would not attempt any treatment.

During the summer he visited three physicians, but after trying many medicines he refused to take opium, fearing lest he contract the habit. On my return in September he promptly made his appearance, complaining bitterly of the pain, which prevented sleep and mastication and was located at one spot where the first molar had been. I examined the alveolus very carefully, but found absolutely nothing to account for the pain. An x-ray photograph was taken, but disclosed no root or evidence of caries. At his urgent request I uncovered the alveolus under hypodermic injection of cocain and adrenalin, but without much hope of locating the cause, believing it to be a case of trifacial neuralgia. On elevating the periosteum I found a curious condition, the socket of the first molar having closed below still remained of almost normal size, was full of granulation tissue and opened into the antrum. I was greatly surprised at this, as I had puctured the antrum through the nose and irrigated it with a solution of boric acid, but got no pus, and the patient declared that he had never had any nasal discharge. The whole thickness of the process was softened and bled very freely until I reached healthy bone, in doing which I had to enlarge the antral opening until I could easily introduce my finger and examine its interior which was found healthy throughout. At one point he exclaimed that I had touched the exact spot, but I saw nothing to account for it. The antrum and cavity were packed with gauze, it being changed daily. For ten days there was almost complete relief, but the pain then returned and was located by him at one spot on the anterior border of the cavity. After cauterizing this, without relief, I again used the bur and opened into another pocket (the bicuspid) filled with the same dark red granulations, which bled profusely, so that I sent them to the laboratory for examination. The report received, however, was that they were granulation tissue with many capillaries but showed no evidence of malignancy. The last operation brought permanent relief, at least I hope that it has, for there has been no pain from November 5th, 1907, to April 10th, 1908, the date of his last visit which he made to pay his bill and give thanks for his cure. He was wearing his old indenture with comfort, and objected to my suggestion to close the antrum opening, which was the size of a small lead pencil, saying that there was no discharge from it, and as it

gave him no trouble he thought he would let well enough alone. I was afraid that this case of tic doloureux was caused by malignant growth, because of the most unusual severity of the pain and the hemorrhagic character of the granulations, and am happy indeed at the result thus far obtained.

CASE XI. Under the title of "An Inflamed Dentigerous Cyst Caused by an Odontoma," I reported a case before the American L. R. & O. Society at its annual meeting in 1905. This case illustrated the folly of the indiscriminate extraction of teeth for the relief of pain before using all available means to determine just where the trouble lies. In this case the original neuralgia was probably caused by the odontoma, and had the dentist done his work completely and not allowed the broken root to remain, he would, in all probability, have cured the neuralgia and removed the undoubted cause of the cyst in later years, at the very first extraction, the original pain having been located by the patient in his bicuspid, the root of which was found by me. I asked for an x-ray in this case, but, being a poor man with a large family, he could not afford the expense and it was really only by chance that its presence was discovered.

CASE XII. This case was also reported by me in full before the 1907 meeting of the American L. R. & O. Society, under the title of "A Case of Fibro-mxyoma," etc. Had this case been seen originally by a qualified surgeon I do not doubt but that thorough surgical measures would have removed the disease entirely and secured a complete cure, thus obviating the further suffering and the very extensive later operation.

The foregoing cases only serve to illustrate the condition of many thousands of patients seen by us but not recognized, our attention not being called to what they believe belongs strictly in the province of dentistry. Unfortunately, there are very few dentists, in the great numbers of those licensed to practice, who are qualified, either by experience or in their college education, to recognize the extent of these cases or the seriousness of allowing them to run on indefinitely. There are, alas, too many who will persist in treating these conditions through the minute root canals. As professor of oral surgery in the College of Oral and Dental Surgery of New York, I saw a

great many cases of these fistulous tracts, and in all cases of long standing advised the free opening of the alveolus and the removal of the carious bone wherever found either with or without the extraction of the teeth, that depending upon the condition of the bone immediately surrounding the tooth. Often it will be found that only one root will be entirely uncovered, and by amputating this and carefully closing the canal entrance the remainder of the tooth can be saved to be very useful, the carious tract being cured. It is absurd to say that it is best to treat these cases through canals when one has once seen the extensive destruction of the bone that will be found in all long standing cases, and we should urge that surgical measures be used in all cases where there has been a so-called gum boil, which fails to heal and leaves a fistula, however small the opening may be, for they are in reality cases of suppurative alveolitis, which have opened through bone tissue and left disease of that tissue, which naturally cannot be reached through the tooth itself.

There are also many cases where teeth have been extracted after long treatment without benefit, and no examination of the socket is made to determine whether there is caries or detached spicula of bone, and, although in some cases Nature succeeds in asserting herself and throws off the dead bone, many of these still retain their discharging fistulas, much to the annoyance of the patient. Another point which I wish to emphasize is the necessity of having all of our friends and patients who have to suffer extraction, either bring the tooth to us or have the dentist report direct, where we know the operator. There are too many cases where the tooth is broken in the attempt and the root is allowed to remain to be the focus of further trouble. I have no doubt that the cases 7 and 11 would have been relieved by the first extraction had it been complete and the dentist honest in his dealing with his patient, but one continued to suffer for over a year, lost a second sound tooth and had to have an osteoma removed in consequence; and the other lost all of his upper teeth and had to undergo an extensive operation for the removal of the large bone cyst in consequence of retention of the broken root with its large odontoma, which was in all probability the cause of the original pain and of the development of the cyst. The more one observes the condition of the teeth in his laryngeal

and pharyngeal cases the more will he be impressed with the great benefits to be obtained by attention to oral hygiene so sadly neglected in many of them. In recent years the dental profession is awakening to the fact that these conditions have a much more serious import than had been given them through many years and they are slowly developing a specialty among themselves, whose members devote themselves to the treatment of surgical cases only, and I am happy to say that much excellent work is being done by some of the men that I know, and that two of the men who brought their patients to me have since done some very praiseworthy work and are most grateful for the opportunity afforded them in seeing what could be done for the relief of what had been to them difficult cases to treat and almost impossible cases to cure. With our experience in surgery of the nasal cavities and especially the mastoid process, the operation for the removal of caries in the alveolus, is very simple and in only one case was the patient anesthetized with a general anesthetic, i. e., Case 2, he having such a large cavity at the examination that I felt it wiser to be prepared for any condition that might have arisen. As it turned out, the operation could have been performed with the local anesthesia very comfortably. Dr. Sinclair Tousey has made some very satisfactory negatives for me by his method of placing a small film on the inner surface of the alveolus, thus taking only that part of the process in which the trouble is actually located, so that there is no confusion in locating roots or caries if they are present.

XL.

SUBMUCOUS RESECTION IN OZENA.*

By Prof. Mermod,

LAUSANNE.

It is well known that ozena may be unilateral, a fact which is naturally regarded as proof of its non-contagiousness. But no one, I believe, has set forth that where the ozena exists on one side only, it is constantly the larger side which is attacked, and that in very marked deviations of the septum the process is limited to the concave side.

Personally, at least, I have never found a unilateral ozena where both fossae were of the same size, and, on the contrary, in every lateralized ozena I have regularly found a septal gibbosity and the atrophic rhinitis on the larger side. Where the deviation is not pronounced the ozena is bilateral, but less marked on the narrow side.

This finding is so frequent, so striking, and its etiologic importance so great, it is surprising that it has not been made before, after all that has been written upon the origin of atrophic rhinitis, fetid or non-fetid. If the fact which I advance has already been observed by others, I do not think that it has been accorded the attention which it deserves.

What do we see in typical cases of this sort? I mean those in which the curvature of the septum is sufficient to efface one naris. On the enlarged side is the well-known picture of classic ozena, dryness, crusts, fetor, atrophy of the inferior turbinate, atrophy or hypertrophy of the middle turbinate. On the narrow side is ordinary catarrhal rhinitis, due to mechanical obstruction, without crusts or atrophy, but with a mucous catarrhal secretion coming forward or into the cavum. Objection cannot here be made that it is not surprising for the narrowed side to be without crusts, since the necessary space is lacking, for there is more than an absence of crusts, the dryness and atrophy also being lacking. The

*Communication to the International Congress of Laryngology at Vienna, April, 1908.

subjective signs correspond to the objective. The patient breathes as badly on one side as the other, since he cannot distinguish between obstruction due to bending of the septum and that caused by the accumulation of crusts, but he does state that he blows green crusts from only one side and ordinary mucus from the other.

It goes without saying that if the malformation of the septum involves only its anterior portion in the form of a spur or luxation of the anterior border of the quadrangular cartilage, leaving a nasal fossa as large behind as its fellow, the ozenous process involves both sides.

The etiology of a disease as complex as ozena has necessarily given rise to innumerable theories. The only one which interests us here is that where, according to Zaufal, we see in congenital enlargement of the nasal fossae, the essential cause of ozena. Inspired by this idea several investigators have sought with more or less success to diminish the size of the fossae, either by tamponing the whole naris (Gottstein) or by anterior occlusion with tampons or obturators, or by plastic operations (Barth and Saenger), or by injections of paraffin.

Now, if any one of these means would cure ozena with certainty, the theory of congenitally large nasal fossae would acquire sufficient importance to be something more than a theory. Unfortunately, this is not the case. However, the interesting fact of lateralization of ozena in pronounced deviation of the septum appears to me to be the most convincing proof that has ever been brought to the support of Zaufal's theory. But, I hasten to add, this proof does not apply in special instances, since in most cases of septal curvature the mucosa of the enlarged side is not only not atrophied, but shows a compensatory hypertrophy, so that sometimes the septum appears to have been pushed aside by the thickened inferior turbinate. From which it is to be concluded that increase in size of one or both nasal fossae, as is well known, can only be a predisposing cause of ozena allowing other factors—microbes, suppuration of accessory cavities, trophoneuroses—to act more effectively.

But well observed facts ought to take precedence over theories, and if, gentlemen, I have succeeded by straightening the median septum in suppressing the cardinal symptoms of ozena, you will agree that this thesis is of more value than you suspected.

If with a good submucous resection I reestablish equality of the nares, I kill two birds with one stone, if I may thus express myself, by suppressing on the narrowed side the simple catarrh due to obstruction, and on the enlarged side the ozenous catarrh. For this it is necessary to make a perfect resection, which is not difficult, the mucosa of the internal wall being much less atrophied than that on the turbinates. The persistence of a septal perforation, however small, while of little importance in the ordinary cases where we do this operation, would here have deplorable consequences, as is readily understood.

I submit to you some cases which are so similar that I can condense them into a few lines.

1. Michel S., Russian, 10 years.—A puny child, adenoid facies. Has always blown a good deal from the left nose, especially since his fifth year (scarlatina). The secretion is purulent, greenish, mixed with crusts. Frequent catarrhal exacerbations during which especially the mother notices the fetor, which leads her to bring the child to me. External nose shows nothing peculiar. Left naris very large, plainly ozenous. The upper part of the naris and middle turbinate, which is large and baggy, are covered with greenish dry crusts, hard to get off. The floor of the nose is bathed in thick mucopus; inferior turbinate greatly atrophied. No sign of sinusitis. Septum much deviated throughout. Right naris very narrow; middle turbinate invisible; inferior turbinate of normal size, touching the septum; mucous secretion, no crusts. Submucous resection. When seen three months later the child seemed absolutely cured, objectively and subjectively. The left naris had a red moist mucosa, without crusts or odor, although the mother had ceased the daily lavages after the operation. Inferior turbinate had a thicker, red, moist mucosa. General condition much improved.

2. Alfred M., Swiss, 17.—Marked deviation of the septum closing the left naris. The right is very large, because of the septal concavity and atrophy of the inferior turbinate. Middle turbinate big and soft, fetor. Not much discharge, but the secretion is muco-purulent, mixed with greenish crusts, covering the external wall and roof; twice a week they are expelled *en masse*. Pharynx similarly covered with crusts—dry atrophic phanryngitis. Immediately after submucous re-

section the result was excellent. Diminution and then disappearance of the crusts, so that the young man no longer used the lavages, which he could not do without previously. Middle turbinate remains large, but less soft, and no longer bleeding at the slightest touch. The inferior turbinate, lubricated and red, seems less atrophic. The cavum still has a little pus, but not drying into crusts. Pharyngeal mucosa remains dry.

3. Alfred M., Swiss, 18.—Atrophic rhinitis from earliest years. Three years ago I taught him to irrigate his nose, and for a long time used friction massage with sulpho-ricinated phenol. Seen again last January 2. Typical picture of fetid atrophic rhinitis. The family is annoyed by the odor. The process localized solely in the very large left naris, made so by the septal deviation. All walls covered with thick greenish crusts separated from the atrophied mucosa by a layer of muco-pus. Inferior turbinate reduced to a thin ledge. especially the anterior portion. On the right side the septum touches the inferior turbinate which is not at all atrophied—no crusts, only catarrhal mucus. Respiration habitually buccal; dry pharyngitis. The voice is frequently interrupted, the vocal cords being slightly crusted without there being exactly a laryngo-tracheal ozena. Resection of the septum done the following day. The results as seen three months later could be called brilliant. The family is particularly delighted with the absence of fetor, although lavage has been stopped. The mucosa is still atrophied, but moist, and without any crusts. Larynx all right and voice clear.

4. Alice F., 22, is also one of my old patients, whom I have given various treatments without success, except that by great care she had lessened the intensity of her trouble. She suffered especially with fetor, and, as she was about to become engaged, her repugnant infirmity made her quite melancholy. It was another typical case of left unilateral ozena with pronounced deviation of the septum to the right. Believing that the cause was an ethmoidal caries, I did several endonasal curettages without any appreciable improvement. I showed the case to the well-known author of "The Coccobacillus foetidus ozenae," my friend, Dr. Perez, of Buenos Ayres, then sojourning with me, and he did not hesitate in the diagnosis of typical fetid ozena. I shall not recount the

subjective signs, which were exactly the same as those in Case 3.

After the submucous resection the reaction was intense, and during the first month the crusts were so abundant and thick that I thought I had failed absolutely. Then came progressive improvement. I saw the patient a fortnight ago, three months after the operation, and had the pleasure of seeing an extraordinary amelioration. Not only have the crusts ceased to form, but the mucosal atrophy, especially that of the inferior turbinate, has so diminished that it is hard to believe in the existence of a former ozena. The patient has given up the lavages, which were a daily necessity and were, she says, "the cross of her life."

These, gentlemen, are the cases which I have had during three months, in which, by the simple suppression of a mechanical fault, the effects were invariably good, notwithstanding a prognosis so unsatisfactory as that of ozena. And I do not think that I am too enthusiastic over the results, which have been watched by my medical associates, assistants, pupils and visiting colleagues. Of course, we cannot speak of a definite cure as yet, and the time is too short since operation to know the final result, but the example of my fourth case permits the hope that with a disappearance of secretion and the atrophying pressure of the crusts upon the mucosa having ceased, the latter will again gradually take on its normal character.

Results less affirmative than mine would not detract from the latter, the negative cases not having the value of positive ones. They simply prove once more that ozena, far from being a morbid entity, is a complex not yet well understood.

It would be fortunate for my assertions to be further confirmed, since they touch upon an important etiologic and therapeutic question.

XLI.

THE TREATMENT OF TUBERCULOSIS OF THE UPPER AIR PASSAGES.

By Dr. Theodor Heryng,

warsaw.

Translated by Clarence Loeb, M. D.,

st. louis.

In my paper I will omit reference to tuberculosis of the mouth, pharynx, nose and nasopharynx, and will discuss only the treatment of tuberculosis of the larynx.

The following prefatory remarks will make the matter clearer:

Larynx tuberculosis, or the phthisis of the larynx caused thereby, can heal spontaneously, without special, local or general treatment.

Most frequently, superficial ulcers of the vocal cords and milder cases of affection of the posterior wall of the larynx and processus vocales heal by cicatrization. Severe, destructive processes, which are accompanied by granulation formation and lesion of the cartilage, followed by dysphagia and consequently rapidly leading to malnutrition and cachexia, very rarely heal, especially in young patients and those affected with diffuse pulmonary affections, accompanied by fever and lowered body resistance.

The best chances for healing is found in those cases where the disease appears as a localized infiltration or tumor-like prominence on the posterior laryngeal wall, which has little or no tendency towards degeneration, causes slight symptoms and is accompanied by no apparent loss of bodily vigor. Here belong, also, the so-called tubercular tumors of the larynx, especially of the false cords.

The worst prognosis is to be given in the diffuse infiltrations of the outer laryngeal borders, viz., the epiglottis, when they extend over onto the false cords and attack the ventricle; furthermore, infiltration of the arytenoid cartilages, which leads to rapid destruction and necrosis, or when accompanied by granulation formation cause stenosis; also, the diffuse, degenerative infiltrations, involving the larynx in toto; finally, miliary tuberculosis.

The possibility of a cure is, in the first place, dependent on the constitution and resistance of the patient, the anatomic character of the pulmonary affection and its extent, the age of the patient, his occupation, his financial status, and the period at which the proper treatment is begun.

Although the tubercular process may heal, or cicatrize, tubercular deposits may remain in the depths of the tissue, which, although subject to fibrous degeneration, possess quiescent germs, which can cause recurrences. This occurs so much more easily if renewed unfavorable conditions, such as straining, cause inflammations, which lead to dysphagia and malnutrition. They almost always lead to exacerbation of the pulmonary lesion. Secondary infections play in laryngeal phthisis the same weighty role that they do in pulmonary tuberculosis.

Of all the various drugs used in laryngeal phthisis, such as creosote-glycerin, phenol, balsam of Peru, sublimate, iodoform, iodol, menthol, etc., the only one that has gained a distinct position in the therapy is lactic acid, introduced by Krause.

This remedy cannot, however, be used in all cases, as it often causes severe inflammatory symptoms. It is indicated in hypertrophic ulcers, in soft granulations, and for the purpose of cleansing the floor of ulcers. It has very little effect on hard infiltrations.

Menthol and iodol are far behind lactic acid. Iodoform is indicated in certain forms of ulcers for cleansing and for excitation of granulation formation.

Phenolum sulforicinicum frequently exercises a favorable influence on tubercular infiltrations, but requires certain precautions in its use.

Cocain and eucain may be used as sprays in 5 to 10 per cent solutions by means of a curved tube, but only during phonation, in order to prevent poisoning.

Antipyrin lengthens the anesthetic action of cocain and eucain (Weil). Orthoform, advocated by Einhorn and Heinz, act well in the dysphagia of larynx phthisis. It acts, however, only on ulcerated surfaces denuded of epithelium, and is absolutely contraindicated in infiltrations. Its action in ulcers lasts from 6 to 10 hours. It is advantageous to prescribe it with an equal amount of talc and an addition of one per cent cocain (or eucain) to 4.0 of orthoform. The insufflations should be repeated twice daily. The patient must be forbidden to gargle or drink afterwards.

For about six years I have been induced by the powerful, deep action of concentrated potassium permanganate solutions in lupus to use it for the destruction of unclean tubercular ulcers, which constantly renew their dirty gray exudate, and the results have been excellent. Such conditions were most frequently found on the infiltrated and ulcerated false cords, never on the true cords or posterior laryngeal wall or epiglottis. This exudate consisted of necrotic tissue filled with innumerable pus cocci, epithelium and detritus. Tubercle bacilli were never found. None of the drugs in use could destroy this exudate. Even after the use of the galvanocaustic and the formation of a scab, the exudate reappeared on the granulating wound. Only after repeated painting with a lukewarm, saturated solution of potassium permanganate did I obtain healthy granulation formation and a slow cicatrization. I judged that the process affected the mucous membrane of the ventricle also, and from there passed over to the false cords. Further observations showed the favorable influence of this remedy on chronic ulcerations and even superficial infiltrations, for which it can be most heartily recommended. Its use is painless, the reaction is nil. The black scab is cast off in two to three days, according to the intensity of the cauterization. Never allow crystals to remain on the swab. The action is very deep, the tissue melts away by a quick necrosis and a deep defect remains. I have observed this deep action in pharyngeal tuberculosis and warn against the use of crystals, on account of the severe pain which they cause.

The solution is made best in a reagent glass, heated to boiling, the crystals pulverized by a glass rod, and the fluid carefully decanted from the precipitate and cooled. The swab must have no excess of the solution. Paint it until the ulcer

has a very dark color. The dysphagia frequently becomes less after the cauterization. The infiltration shrinks and becomes covered with new granulations after the scab is cast off.

I have used the same drug in nasal tuberculosis, lupus and syphilitic nasal ulcers, frequently with quick result. It is, however, no panacea, for I had, also, cases without results and had to use surgical treatment.

The treatment of laryngeal phthisis is divisible into two groups, according to the nature of the disease, i. e., the treatment of the laryngeal lesions, and that of the pulmonary, which almost always complicates it.

In a disease which has lasted many years, it is necessary for the patient to learn that improvement and eventual cure is obtained by prevention of the unfavorable conditions which have caused it.

The localities along the Mediterranean, of the Riviera or Levant, although they have a lime subsoil, have in many cases been found to be satisfactory (Mentone, San-Remo, Cannes, Nervi). Favorable results have also followed residence in Meran, Arco, Palanza, and, in summer, Gleichenberg. According to my mind, the choice of the place is far less important than the choice of the physician. Weak patients with high fever, severe dysphagia and extensive pulmonary involvment, and who are poor, should not be sent to these far away places.

The first condition for the improvement of these patients consists in access to an abundance of pure, fresh air.

Feverish patients, so long as their strength allows, are kept in bed, in order to conserve their strength and prevent discomfort and weakness.

The partial, temporary and frequently insufficient results of the treatment with lactic acid, as well as those of the incision in the infiltrated epiglottis or posterior laryngeal wall, as recommended by Moritz Schmidt, and which in some cases causes a diminution of the dysphagia by means of a stretching of the tissues, compelled us to seek other remedies and methods which could produce positive and lasting cures. For this reason I proposed, in 1888, a surgical treatment of larynx phthisis, and published its basis in my book "Die Heilbarkeit der Larynxphthise und ihre Chirurgische Behandlung."*

*The Curability of Phthisis Laryngis and Its Surgical Treatment.

Antipyrin lengthens the anesthetic action of cocain and eucain (Weil). Orthoform, advocated by Einhorn and Heinz, act well in the dysphagia of larynx phthisis. It acts, however, only on ulcerated surfaces denuded of epithelium, and is absolutely contraindicated in infiltrations. Its action in ulcers lasts from 6 to 10 hours. It is advantageous to prescribe it with an equal amount of talc and an addition of one per cent cocain (or eucain) to 4.0 of orthoform. The insufflations should be repeated twice daily. The patient must be forbidden to gargle or drink afterwards.

For about six years I have been induced by the powerful, deep action of concentrated potassium permanganate solutions in lupus to use it for the destruction of unclean tubercular ulcers, which constantly renew their dirty gray exudate, and the results have been excellent. Such conditions were most frequently found on the infiltrated and ulcerated false cords, never on the true cords or posterior laryngeal wall or epiglottis. This exudate consisted of necrotic tissue filled with innumerable pus cocci, epithelium and detritus. Tubercle bacilli were never found. None of the drugs in use could destroy this exudate. Even after the use of the galvanocaustic and the formation of a scab, the exudate reappeared on the granulating wound. Only after repeated painting with a lukewarm, saturated solution of potassium permanganate did I obtain healthy granulation formation and a slow cicatrization. I judged that the process affected the mucous membrane of the ventricle also, and from there passed over to the false cords. Further observations showed the favorable influence of this remedy on chronic ulcerations and even superficial infiltrations, for which it can be most heartily recommended. Its use is painless, the reaction is nil. The black scab is cast off in two to three days, according to the intensity of the cauterization. Never allow crystals to remain on the swab. The action is very deep, the tissue melts away by a quick necrosis and a deep defect remains. I have observed this deep action in pharyngeal tuberculosis and warn against the use of crystals, on account of the severe pain which they cause.

The solution is made best in a reagent glass, heated to boiling, the crystals pulverized by a glass rod, and the fluid carefully decanted from the precipitate and cooled. The swab must have no excess of the solution. Paint it until the ulcer

has a very dark color. The dysphagia frequently becomes less after the cauterization. The infiltration shrinks and becomes covered with new granulations after the scab is cast off.

I have used the same drug in nasal tuberculosis, lupus and syphilitic nasal ulcers, frequently with quick result. It is, however, no panacea, for I had, also, cases without results and had to use surgical treatment.

The treatment of laryngeal phthisis is divisible into two groups, according to the nature of the disease, i. e., the treatment of the laryngeal lesions, and that of the pulmonary, which almost always complicates it.

In a disease which has lasted many years, it is necessary for the patient to learn that improvement and eventual cure is obtained by prevention of the unfavorable conditions which have caused it.

The localities along the Mediterranean, of the Riviera or Levant, although they have a lime subsoil, have in many cases been found to be satisfactory (Mentone, San-Remo, Cannes, Nervi). Favorable results have also followed residence in Meran, Arco, Palanza, and, in summer, Gleichenberg. According to my mind, the choice of the place is far less important than the choice of the physician. Weak patients with high fever, severe dysphagia and extensive pulmonary involvment, and who are poor, should not be sent to these far away places.

The first condition for the improvement of these patients consists in access to an abundance of pure, fresh air.

Feverish patients, so long as their strength allows, are kept in bed, in order to conserve their strength and prevent discomfort and weakness.

The partial, temporary and frequently insufficient results of the treatment with lactic acid, as well as those of the incision in the infiltrated epiglottis or posterior laryngeal wall, as recommended by Moritz Schmidt, and which in some cases causes a diminution of the dysphagia by means of a stretching of the tissues, compelled us to seek other remedies and methods which could produce positive and lasting cures. For this reason I proposed, in 1888, a surgical treatment of larynx phthisis, and published its basis in my book "Die Heilbarkeit der Larynxphthise und ihre Chirurgische Behandlung."*

*The Curability of Phthisis Laryngis and Its Surgical Treatment.

Under the surgical treatment I had the following to say: "Above all, the attempt must be made by means of the most energetic destruction or removal of the tubercular infiltrate and its products, to get rid of everything that is diseased or degenerated, and to change the ulcers into benign ones and aid their healing; furthermore, by causing the cicatrization of these ulcers and the cure of the accompanying inflammation, to successfully combat the dysphagia and to limit the imminent dangers. A therapeutic factor of no less importance consists in the building up of the body, in the prevention of all untoward conditions, and in the securing of good climatic and hygienic conditions."

It is, of course, self-evident that no method and no remedy can be considered as a panacea for any disease, especially such an unreliable condition as larynx tuberculosis. The cicatrix obtained and the lasting cure must be regarded not so much as the result of one certain treatment, but as the result of relatively complicated methods composed of the most varied therapeutic and hygienic rules.

Their result is no stable one, but is dependent on their energetic employment, and is obtained only in certain forms and stages of the disease, under especially favorable circumstances. Although I lay a great stress on the technic of the surgical treatment of phthisis laryngis and insist upon this always, I am far from believing that a perfect technic is all that is necessary to treat the patient successfully.

The physician must be therapist and surgeon in so far as the local treatment has a good prognosis only when accompanied by care of the general condition, the nutrition, and the pulmonary affection.

The statements mentioned here were made by me twenty years ago. I have been true to them in deed and word. They seem unknown to many of my colleagues, and therefore I repeat them here to prevent ungrounded attacks on the person and the method.

I have been accused of a too great optimism in regard to the results of surgical treatment and a too great enthusiasm in carrying out this method.

I should like to quote a sentence from Kant: "Enthusiasm

is that property of the human mind without which no good is ever accomplished."

It is a peculiar fact that this accusation has come chiefly from those of my colleagues who have had either little or no experience in this direction, and who, after a few usually unsuccessful experiences, have abandoned it. Some of them probably used the method in unsuitable cases. Others were discouraged on account of the difficulty of the technic, a somewhat severe hemorrhage or the use of badly chosen instruments.

In a disease considered twenty years ago as incurable, whose energetic treatment was regarded as a medical mistake (Stoerk), an unnecessary handling of infiltrations (Schroetter), or as a torment to the patient, it was a bold proposition to suggest a surgical treatment. The first cases published by Krause and myself were characterized as diagnostically uncertain. We were asked for cures of the gravest cases, patients with cachexia and diffuse infiltrations and ulcers. Every lack of result, every relapse, every passing exacerbation of these unreliable cases was used as a weapon against the method and its discover, and in certain clinics and hospitals were demonstrated to students and physicians as warning examples of the perniciousness of this method, which was condemned.

Gradually, through the aid of many trustworthy colleagues, this judgment was destroyed and the observation of more lasting cicatrization and cure of even severe cases gave an impetus to the energetic treatment (Schech, Keimer, Gleitsman, Gougenheim, Balzer, Massei, E. Fraenkel, Tessier). S. Srebrny in 1897 published a careful collection of all cases published between 1887 and 1897. Only eight authors had opposed this method, some of whom did so without personal experience and on purely theoretic grounds.

At the meeting of the Tenth International Congress in Berlin, 1880, I demonstrated a patient who had been cured for two years of a severe laryngeal phthisis. Furthermore, I showed the larynx of a patient who had been cured for three years, but who had subsequently died of intestinal tuberculosis; also, a number of cases where through surgical intervention, i. e., curetting the ulcers, or removal of the tubercular infiltration with sharp forceps, permanent cicatrization or im-

provement took place in the larynx. Most of the members were convinced of the correctness of my deductions. These were very forcibly supported by Moritz Schmidt and Hermann Krause. However, we were unable to overcome the opposition despite the fact that the specimens were recognized by Prof. Virchow as completely healed. Since certain members demanded a microscopical examination for the purpose of determining whether tubercular foci were present in the deeper tissue, under the scar, the specimen was sent to prosector Eugen Fraenckel at Hamburg. The result of his examination ran: "There was not even a trace of anything that could have been called a tubercle or like one."

Four years later the question of surgical treatment of larynx phthisis was again discussed at the Eleventh International Medical Congress at Rome. Gougenheim (Paris), Lennox-Browne (London) and the author were chosen as essayists. Eighteen members of the laryngologic section took part in the discussion. The result of the very earnest debate, which took place under the presidency of Dr. F. Semon, was a very favorable one for the value of the surgical treatment. Fifteen members argued for it on the grounds of personal experiences.

Just as favorable were the reports of Lennox-Browne and Gougenheim, who had used the method in fifty-eight cases and had obtained a cure in twenty-five cases and a distinct improvement in thirty. I discussed then the subsequent course of the cases cured since 1887, and presented to the section a colleague from Dynaburg, Dr. Sczastny, who for four years had been cured of a severe diffuse laryngeal phthisis, had recovered voice and deglutition, and showed such an improvement in his general condition and the pulmonary process that he could readily fulfill his office as chief physician of a large military hospital.

A distinct change has in a few years come over the position as to the surgical treatment of phthisis laryngis. Burger says that "after the original recommendations of Moritz Schmidt and Heryng had met and withstood a violent opposition, there appeared a stage of recognition, whose celebration at the Eleventh International Congress at Rome in 1894 will always be a source of pleasant recollection. At that very time, as Krieg correctly observes, the advocacy of energetic method was at its zenith. Since then it has declined, and I was afraid

that Kronenberg was too optimistic when he thought that now since the enthusiasm had passed away, a sober judgment would rule, which would be as far removed from doubting despondency as from thoughtless overvaluation of our ability and knowledge."

"Like Krieg," continues Burger, "I have gained from the literature of the last few years the impression that a large number of laryngologists have confined themselves to the use of antibacterial and disinfecting remedies, that most of them use lactic acid, and that relatively few treat suitable cases perseveringly and intelligently according to the principles of surgical therapy.

"With such facts in mind, one asks in astonishment whether the earlier enthusiasm was founded only on idle dreams and whether the well-known cures were only the result of an uncriticizing enthusiasm." Burger then addressed himself to those colleagues who, in his own words, broke ground in this field, and who had for the longest time carried out the treatment, viz., Moritz Schmidt, Krause and myself.

He received from M. Schmidt the following statement: "Almost one-fifth of the cases were cured. Part of them suffered from relapses, especially when the lungs were not cured." Schmidt, however, has observed for years patients whose larynx and lung affections have been cured, and who were not reinfected.

Five months ago I inquired from Prof. Spiess, of Frankfurt, the worthy co-worker of Moritz Schmidt, as to the number of curettements made by them and the details of the results of their treatment.

Prof. Spiess estimated the yearly number of currettements at about 400, i. e., at about 6000 for the last fifteen years. He authorizes me to state here that he curettes energetically, excises and works with cutting instruments without having observed that new infections were caused thereby. On the contrary, he ascribes to this therapy a large number of cures.

Krause also, says Burger, still sticks to his earlier optimistic standpoint. He is convinced (*Monatsch. f. Ohrenheilkunde*, 1904, p. 381) that this method "would be as successful to anyone, who used it intelligently and with a proper technic," as to him.

When I learned that Krause could not take part in this

congress, I went to him at San Remo, and am authorized to communicate his views.

He estimates the number of curettements performed in his policlinic and private practice at about 4000. He had never observed a secondary infection. Even in the worst cases he saw an astonishingly rapid closure of the wound.

Krause has not discarded the galvanocaustic treatment, as it is very convenient in many cases which are inaccessible except with difficulty with the surgical instruments. Furthermore, he does not doubt, though personal experience is lacking, the good results of Krieg, Mermod, etc. He cannot, however, regard this method as a panacea, which could only be claimed by one who is autocratic enough to be impatient with any method save his own. According to Krause, the galvanocaustic is only an aid to the radical surgical treatment.

In his second article, published in 1904, in the *Arch. f. Laryngologie,* Krieg says that lately he had successfully replaced the purely surgical treatment by the galvanocaustic, or had used them combined. Out of over 200 cases Krieg had obtained a permanent cure, i. e., cicatrization, in 60 poor patients, without any cauterizing agent or lactic acid. Occasionally he saw granulation formation in the vicinity of the cicatricized wound, which he regarded as an expression of the vulnerability of the tissues over the deeper, infiltrated areas.

That these results were not temporary is shown by the following letter sent to me by Krieg in May, 1908:

Dear Doctor:—

To your questions I can reply as follows:

1. I have curetted 73 times.
2. I have never had a dangerous hemorrhage.
3. I have never seen a succeeding miliary tuberculosis, nor have I observed a dangerous reaction follow the galvanocaustic.
4. I have seen 48 cases where the cure of the laryngeal tuberculosis lasted for three years. It must be stated, moreover, that an inquiry, which I have not conducted since 1904, would doubtless reveal other cases as cured.
5. An indication for total extirpation of the larynx never was seen by me.

Very sincerely,

KRIEG.

The same year there appeared the great work of Mermod

(Lausanne). By the use of sharp forceps or the galvanocaustic, he obtained lasting cures in 60 cases of diffuse phthisis of the lung and larynx of the severest type. He was able in 1903 to present 18 cured patients before the annual meeting of Swiss physicians. Of 240 cases of larynx phthisis, the cure lasted

in 60 over 1 year,
in 40 over 2 years,
in 17 over 3 years.

Even in the most severe cases, which died later on from their lung affection, Mermod obtained distinct improvement of the voice and deglutition.

That Sir Felix Semon, whom Grünwald designated as one of the opponents of surgical treatment, must be removed from their ranks is shown by the following extract from his letter of May 28, 1908:

"I think that I have clearly enough stated that we should be thankful to you for your untiring advocacy of surgical intervention in appropriate cases. I, myself, always operate in such cases, only I cannot go so far as Prof. Mermod, according to whose own words, there is no contraindication for the use of the galvanocautery in laryngeal tuberculosis. I have expressed myself in the same way in all of my writings."

We will now let the opponents of the purely surgical treatment (sharp instruments) speak, and will now commence with Grünwald. His successful results from the use of deep galvanocauterization have led him to call this method the sovereign one, and to discard the purely surgical method for fear of tubercular and purulent infection.*

Grünwald designates most of the remedies hitherto employed against laryngeal tuberculosis as unsuitable, especially the chemical cauterants, the cutting laryngeal instruments, but more especially the tearing and crushing ones, on account of injury through unnecessary and dangerous superficial traumatism and insufficient deep action. He fears to lay bare simultaneously tubercular and normal tissues—whether it be the blood or lymph system—by which a local or even a general dissemination of the infection might be caused (p. 37).

"This danger can be prevented only when this excision takes

*Die Therapie der Kehlkopftuberkulose mit besonderer Berücksichtigung auf den galvanokaustischen Tiefenstich.

place in the healthy tissue outside of the diseased area, or when the treatment leads to occlusion of the paths of infection or to the death of the germs. For this reason alone should protection of the surface be our motto. Only the smooth excision of more or less pedunculated parts would cause no damage. Here the loop comes into consideration."

According to Grünwald, the galvanocautery—the deep incision—must be considered as a panacea, on account of its slight reaction, since it gets rid of the diseased tissue and the bacteria quickly and completely, and makes possible desired result, since the infiltrate extends beyond the recognizable borders of the focus.

As to the method, Grünwald uses about a dozen lines in its explanation:

"The burning point is placed on the selected spot, and after it has been heated, is slowly pressed into the tissues, until either the distinct resistance of the normal tissues or the reddish gleam in the subglottic space calls a halt. The point should act until it is movable in the puncture-canal, about 5 to 10 seconds. Not more than two punctures should be made on account of reaction which will follow. In general, all symptoms disappear in 8 to 14 days; the scab disappears unobserved. When the burn is severe, there is a large sloughing of necrotic masses, followed by a negligible swelling."

A complete discussion of Grünwald's interesting article would transgress the limits of this paper, and will be done elsewhere. The chief point of his theory, the necessity of preserving the epithelium of the tubercular infiltration and the warning against the purely surgical method on account of infection, these have been shown by Schmidt, Spiess, Krause, Gleitsmann, Besold, Gidionsen, and by my observations of 20 years as not substantiated by clinical findings. He is right, however, when he says that infiltrations which for a long time resist degeneration, are circumscribed and exist in relatively well nourished individuals, free from fever and without dysphagia, may be treated conservatively, especially in patients who are living in sanatoria or health resort clinics. The number of curettements performed by the above named colleagues is over 12,000. According to oral and written testimony, not one of them has frequently had a severe hemorrhage or tubercular infection following a surgical intervention.

I will now take up the views expressed in a very interesting article, published this year by Besold and Gidionsen, entitled, "Pathologie und Therapie der Kehlkopftuberkulose." I can review here only the treatment, and that briefly. The interesting microscopical findings deserve great consideration, especially the photographic reproductions of microscopic specimens.

Their material consisted of 500 cases of larynx tuberculosis treated during the last 10 years at Falkenstein a. Taunus.

Of all the different methods of treatment, the surgical was found to be the best in the severer cases of larynx phthisis.

"We must characterize the instrumental treatment of laryngeal tuberculosis as very beneficial," say the authors, "and would not approach this disease without the double curette, until some better method is discovered (p. 87). Also, the extirpation of very swollen and infiltrated areas, although no more forcible method seemed to be indicated, not only caused an amelioration of existing symptoms and functional disturbances, but seemed directly commanded for humanity's sake.

"The double curette is better than the simple. The surface of the wound is covered with a scab either by the 75% lactic acid or the cautery, especially when it is not very large.

"The electrocautery—as it should be called instead of galvanocautery—deserved to be widely employed. That a reaction follows its use is conceded. To lessen it, the cautery should be used almost *white-hot* in order to attain the carbonizing of the tissue with the formation of a black or yellow scab. If it is insufficiently heated (red-hot) a white scab is formed, a necrosis, causing pain and dysphagia.

"Such scabs often require two to three days for sloughing, and are to be regarded as the result of insufficient incandescence. Care must be taken, therefore, to use the most intense heat, but to leave in contact the shortest possible time, repeating if necessary. If this is done, the reaction is minimal. It is over in a couple of days.

"Porcelain points are used for large surfaces and platinum for smaller. Grünwald's deep galvanocaustic puncture they consider an electrical overheating with metallic electrodes, since the point in its canal, even when the current is very strong, has a very faint glow or none at all, and heats the surrounding tissues so much that it leads to necrobiosis."

The results of the surgical treatment of Besold and Gidionsen were dependent on the general resistance of the patient, the severity of the local condition and the pulmonary disease, and finally on the correct and timely treatment. Of the 500 tubercular patients, 20 per cent were cured, and this lasted often eight to ten years.

As to the hemorrhage, which is supposed to be prevented by the galvanocautery, this is true only of the red-hot cautery, for the white-hot porcelain point does not prevent hemorrhage.

Why Grünwald was so afraid of artificial wounds could not be understood by the authors. On the contrary, they agree with other authors that this theoretic consideration was not borne out and that much oftener the artificial wounds very quickly were covered over and closed.

Friedrich (Kiel) in his last article opposes Grünwald's fear of injury to covering epithelium of the tubercular infiltrate.

Burger, in his last article on the importance of laryngeal tuberculosis, says: "Kronenberg's assumption that the results are dependent on chance does not seem to me permissible, because the most active, optimistic and restless champion of active treatment is always getting new results. And here, according to him, is the explanation of the distinct difference in the opinions of the writers. The surgical treatment demands not only a well developed technic, which, of course, is present in all the authors who have related their experiences, but it also demands a stock of patience, perseverance and faith. Whoever is scared off by a dozen disappointments and bad results and retires to the ranks of the nihilists, will have no correct judgment as to the possibilities of the surgical treatment. Entrance into this Holy Place is allowed only to believers. For the correct judgment of the value of this method, the hyperpessimistic, impatient and inexact therapist must be unconditionally excluded."

Everyone who has collected experiences extending over a long time in the surgical treatment of laryngeal phthisis, whether they be with cutting instruments or the cautery, will agree with Lermoyer, who has the following to say in regard to this method:

"In place of learning a new method, many find it easier to deny its correctness and results. Thus patients with laryngeal phthisis, who complain of fearful dysphagia, and are dying

of hunger, are treated with gargles instead of procuring relief for them by curettement."

In agreements with Spiess and Krause, I have practically never seen a tubercular infection of a wound. In order to prevent the purulent infection of a wound, I use an alcoholic malachite-green solution of 1 to 2 per cent and can heartily recommend this after eight years' use. The astonishing disinfecting power of organic dyes was discovered by Koch in 1880 and investigated further by Behring. He showed that this remedy far exceeds the action of sublimate on anthrax.

In 1890 Stilling introduced methyl violet under the name of pyoktanin. This preparation has the power of checking suppurations and preventing them without causing any irritation of importance. Bresgen, by experiments extending over a long time, showed the advantages of this treatment, and I can substantiate everything he says. By the correct use of pyoktanin, we are not only able to favorably influence infectious and inflammatory conditions of the throat and tonsils and even cure them, but what is of more importance, are also able to avoid, after bloody or galvanocaustic operations in the nose, throat and larynx, an inflammatory reaction with all its sequelae, such as swelling, pain and suppuration.

I used pyoktanin for several years, until on the advice of Behring I gave the preference to malachite-green (Grübler). This drug has about three times the bactericidal power of pyoktanin. On some bacteria it has an almost specfic action. For example, it acts against anthrax and the comma bacillus about one hundred times as well as against the typhoid bacillus. According to Lingelsheim, streptococci cultures are killed in two hours by a proportion of 1 to 700.

For these reasons I use this drug for after-treatment, after the curettement and galvanocaustic treatment of tubercular ulcers and infiltrates.

The objections brought against this method of treatment are based on the following points: the malachite-green soils both physician and patient and sticks to linen and hands as green spots, which are hard to remove. In the larynx it causes a sensation of burning and dryness and has a taste, which to many is unbearable.

All these objections are of little importance when we consider its power of preventing inflammation, and must cause wonder that they are used as a basis for refusing its use.

If we understand it correctly, the objection is that malachite-green frequently stains the hands and laundry of the physician. The contraindication therefore is a purely personal objection to the loss of time in cleaning the spots.

Anyone who has used malachite-green for a long time and correctly, that is in fresh solution and proper dose, after operations on the mucous membrane of the upper air tract, will put into the background the inconveniences attending its use when he considers its very distinct advantages. By observing certain cautions, its bad features can be easily prevented. From my experiences I can give the following advice as to its use:

The malachite-green should be used only with a cotton-wound applicator, and only to the extent of a dark green coloration of the wound. Care must be taken to avoid an excess of the drug, by dipping the applicator in a vessel containing only enough fluid to be absorbed by the cotton. After the application the patient must neither cough nor spit. Only after some time may he take a drink of water. Many patients, however, on account of the bad taste, spit out the colored spittle at once, and stain their lips and chin. Cotton dipped in alcohol, will remove the stain. The patient must be warned not to spit into his handkerchief. In one's own interest, one should warn the patient not to cough, but if he does so anyhow, should be careful to get out of the way.

The well-known ink-spot eradicator (Weinstein's rods) removes the green color from the skin in a couple of seconds, as do ammonia and alcoholic potassium solutions.

When possible, the solutions should be made fresh, in small quantities, and kept from the light in dark bottles.

The first to use the galvanocautery in laryngeal phthisis was Voltolini. Discouraged by bad results he discarded this method.

Further experiments by Schaeffer, Pieniazek, Lublinski, Goughenheim and L. v. Schrötter gave relatively good results, but did not lead to its general use. A noteworthy article by S. Srebeny (*Medycyna*, 1893), who obtained cicatrization in almost every one of 13 cases, was not able to make it accepted, as the paper was published in Polish. In spite of my early bad results, observed in hospital practice, I have for 15 years used the galvanocautery, loop or point, in certain cases with

advantage, especially in tumor-like infiltrations and granulation formations on the false vocal cords and posterior laryngeal wall, not only in tuberculosis, but also in scleroma and syphilitic granulation products. In such conditions they have given me the best of results.

In comparing the galvanocaustic with the purely surgical method, one point deserves special notice. Many writers claim that the use of the former in laryngeal phthisis demands a less degree of technic than the use of the cutting forceps. This view is eroneous. The correct use of the galvanocautery in the larynx requires a very exact technic and experience. The dosage of the heat is not so easy to learn as it is thought to be by many colleagues. Also, the form, length and thickness of the platinum point must correspond to the degree of destruction desired. All so-called galvanocautery knives must be discarded, to be replaced by double points, spiral points or small porcelain points. A complete severance of the infiltrated false cords with opening of the sinus and without burning or injury to the vocal cords demands a steady hand and a sure eye, and is technically as difficult as the use of Landgraf's double curette in this region. The same is true of all galvanocaustic operations on the vocal cords, especially their inferior surfaces. Here, every excess is a direct injury to the cords, from doing which I would give the strongest warning.

The possibility of hemorrhage after surgical intervention must not be overlooked.

Its frequency and danger seems to me to be exaggerated. Mermod is the one who insists on this most strongly. In more than 10,000 cases there were about 6 fatal and 15 severe hemorrhages. A fatal one two hours after curettement (from an angioma) was observed in my division of the St. Rochus Hospital by one of my assistants. I, myself, have seen eight severe hemorrhages in 1000 curettements, all of which could be checked.

M. Schmidt reports a case of fatal hemorrhage (the autopsy showed an angioma as the source) and a long, severe venous hemorrhage, which was checked by loosening the constricting clothing. Mermod saw a hemorrhage, from the results of which the patient died several days later. Two severe hemorrhages happened to my assistant, Dr. Wroblewski, after excision of the sclerotic false cords. I, too, have seen prolonged

hemorrhages after operations on the false cords and the epiglottis, especially if the vein on the lingual surface was injured. I suspect that the number of copious hemorrhage is larger than is indicated by the literature, but I regard the wild fear of the many knife-shy colleagues as overdrawn and agree with Krause, who never saw a severe, unchecked hemorrhage in about 400 curettements, and who is disposed to refer it, when it does occur, to an improper technic. A few words here as to hemostasis. In parenchymatous hemorrhages, I use a 10 per cent cocain spray with an addition of adrenalin, followed by applications of small cotton tampons dipped in 5 per cent perhydrol. If it continues, a tampon dipped in a 20 per cent cocain solution is pressed against the bleeding area, and allowed to remain a half minute, followed by application of equal parts of lactic acid and liquor ferri sesquichloratum. In the case of small spurters (epiglottis) I apply, after thorough cocainizing of the bleeding area and pressing with cotton tampon dipped in perhydrol, the red-hot galvanocautery. Internally, secale cornutum is given. Also morphin for cough, ice collars, ice pills, absolute rest, speaking being forbidden.

In a case of dangerous hemorrhage from the false cords (scleroma laryngis) in a previously tracheotomized patient, I was compelled to use the double tampon by means of two tampons tied by ligatures. A double thread was passed by means of a Belocque's probe through the tracheal opening into the mouth and drawn outward. A small tampon was tied to the tracheal and a large gauze one to the oral end, both threads were drawn in opposite directions so that the smaller tampon was drawn through the tracheal opening below the vocal cords, while the larger was pressed against the introitus laryngis. After both had been fastened to the introduced tracheal canula, the hemorrhage was checked.

THE SURGICAL TREATMENT IS INDICATED.

(a) In tubercular tumors of the larynx.

(b) In circumscribed, chronic, tumor-like infiltrations of the posterior laryngeal wall, which show little tendency towards degeneration.

(c) In chronic ulcers, resting on an infiltrated base and surrounded by granulation products, which resist other methods of treatment.

(d) In unilateral disease of the larynx, even when the epiglottis, false cords and aryepiglottic folds are involved.

IT IS CONTRAINDICATED.

(a) In severe pulmonary phthisis combined with malnutrition and wasting.

(b) In diffuse miliary tuberculosis of the larynx, or of the larynx and pharynx.

(c) In all cachectic conditions.

(d) In severe laryngeal stenosis caused by inflammatory swelling of the affected parts (here the quickest possible tracheotomy is demanded).

(e) In frightened, nervous, irritative, distrustful, listless patients and those who frequently change doctors, but especially in persons whose general condition promises little for cure.

The surgical treatment demands from the physician devotion to the patient, patience and great persistence, as well as the most complete knowledge of the technic and an exact, sharp instrument. It should as far as possible not be performed on out-patients. The greatest attention must be used in the after-treatment, and the patients should be under observation for months and often years.

The operation is very slightly painful, if the cocain has been used correctly.

The relatives as well as the patient should be told beforehand that the trouble in swallowing cannot be cured at once by the operation, that it is frequently made worse for some days afterwards, and that the performance of the operation only in exceptional cases brings about a radical cure of the larynx. Furthermore, it would be well to state that the removal of the infiltration is rarely possible at one operation; that in spite of the operation, relapses may occur in the larynx; and that the physician can give no guarantee of the eventual cure.

After 20 years' experience I can confirm the conclusions stated in my address before the International Congress at Berlin:

"In combined phthisis of lungs and larynx, surgical intervention can cure localized disease of the larynx and restore its function. Nevertheless, relapses are not always prevented,

whose further development on account of lesions in the lungs is not checked by the operation alone, without a corresponding general treatment, which latter must be always looked upon as the most important factor in the therapy."

I should like to add:

(1) The galvanocaustic treatment alone, or combined with surgical intervention, gives the best results in localized infiltrations and relatively good general condition.

(2) The fear of tubercular infection and severe hemorrhage is unfounded.

(3) Severe cases of laryngeal and pulmonary phthisis should be treated in sanatoria by specialists thoroughly trained in the technic.

As to the cure, I think only such cases should be considered cured where the larynx has regained its normal functions, i. e., vocal and deglutive power, where the general condition and nourishment leave nothing to be desired, where the pulmonary process has been checked, where cough and expectoration have disappeared, and where this favorable result has lasted at least one year without a relapse. An observation of several months is insufficient to place such an improvement in the category of "cured" (Besold and Gidionsen).

THE EXTERNAL OPERATIONS.

Here belong:

(1) Tracheotomy.

(2) Laryngofissure.

(3) Extirpation of the larynx.

Tracheotomy was first recommended by M. Schmidt, not only as an indicatio vitalis, but also as a curative measure, though Schmidt, in his book, says that since he has come to use the surgical treatment more and more and perhaps with better technic, he is finding less and less occasion to recommend tracheotomy. A further contribution to this question is furnished by Henrici. He recommends it for children, in healthy or slightly affected lungs, and relatively benign cases of laryngeal tuberculosis. Mermod is against tracheotomy as a curative measure, and employs it only in very severe laryngeal stenosis.

In hospital practice I have seen several times a tubercular infection of the tracheal wound in decrepit patients, with sputa filled with bacilli. The fault lay on the poor appointment of my division, insufficient ventilation and malnutrition of the patient. I have observed the local infection of the tracheal wound much less frequently in private practice.

Laryngofissure and Extirpation of the Larynx.—According to Grünwald, they are indicated in those processes or localizations whose cure seems impossible by the endolaryngeal method. Especially in perichondritic processes and their relapses, and also in very extreme disease we must think of external operations.

The first radical operation for laryngeal tuberculosis was performed in 1870, unintentionally, however, as the diagnosis was carcinoma. In the course of the following 35 years Grünwald found only 93 similar operations.

A very careful, statistical review of the histories, which unfortunately were not exact in many cases, gave the following:

67 per cent died soon after the operation.

8 per cent died from a short time to one year afterwards.

17 per cent were cured temporarily, without any report as to the subsequent course.

Grünwald designated the laryngofissure as an operation not dangerous in itself, so that in the future we need not take into consideration death from the operation, since it is connected with no danger to life. There is, however, the danger of tubercular infection of the wound through contact with pulmonary secretion containing turbercle bacilli, just as was observed in tracheotomy. This condition happens rarely. It can be prevented by operating only in healthy tissue, by performance of the operation only after an upper tracheotomy, and finally by an immediate closure of the wound. As to the influence of the laryngofissure on the general condition, an exacerbation was noticed in many cases, though this is not to be regarded as a rule.

Another disadvantage for the patient can arise through the formation of stenosis. This happens when two opposing surface are apposed and grow together. It can be prevented if it is possible to avoid long contract of the surface of the wounds.

The conclusions drawn from his statistics are expressed as follows:

Even in the initial stages of a lung affection, especially when the larynx is greatly involved, one should by all means refrain from extensive operations.

Extirpation of the Larynx.—The indications for this severe and often fatal operation are very limited. It demands the most perfect technic and the greatest care in the after-treatment, independent of the instinctive aversion of the patient to this severe operation, although favorable results have been obtained in this field. This is shown in the wonderful demonstrations by Prof. Gluck before this congress. In five patients operated for laryngeal carcinoma, lasting cure for years was obtained with restoration of a relatively loud and distinct voice. The patients breathe without a canula, swallow without difficulty, look all right, and are able to carry on their occupations.

In regard to the *phototherapy* attempted by Stillman and L. v. Schrötter, introduced by Sorgo, and tested by Kimwald, Jessen and Baer, I have no personal experience. In certain cases favorable results have been obtained, but their number is too small for positive conclusions and comparisons with the more energetic treatments.

Probably electric light will replace sunlight. The method is trying on the patient. Jessen allows the patient to be illuminated 5 minutes, and repeats this every hour. Still, I would advise methods which yield quicker results in cases where two weeks have passed without any distinct improvement.

I consider it a great service of Dreyfuss when in a discussion in our congress he insisted that physicians should send their laryngeal phthisis patients to us at a time when they are still curable. "I know," says the author, "that under certain circumstances distrust is caused by propagandistic acts. It will be called an unfair advertisement, a hunt for practice. These belittling thoughts must disappear and those who utter them be silenced when we declare to others that we are acting in the interest of a higher than personal motive, when we say to ourselves that we are doing nothing more than our right and duty, and when we take counsel for the combating of the plague of tuberculosis."

When I read these sentences of true humanity, I involuntarily thought of my home city, where, with a few exceptions,

my attempts for years to introduce the surgical treatment has not only been fruitless but has been met by dead silence or discredited as injurious. I have never fawned on colleague or patient, never attempted to make everything alright and to swim with the current. The distrust of most colleagues for the surgical treatment is perhaps due to my own resignation and lack of patience in attempting to convince the principal opponents and their students. The present congress, which has given me the agreement of the most learned and skilled colleagues, will assist in removing the prejudices, help truth to victory, and bring to the unfortunate patient relief at least if not always a cure. As to the reproof that I am again bringing up a well-worn theme, I can answer with Goethe, "The truth must be continually repeated, for error is by the individual and by the masses."

Interest in this very important question has been again excited by the good results of Krieg, Mermod, Grünwald, Besold and Gidionsen, and lately of Friederich of Kiel, obtained by the use of the galvanocaustic, or the combined method (curette and galvanocaustic). The brilliant progress in laryngeal surgery, as laryngotomy and extirpation of the larynx, bring us in certain cases to the more radical methods.

I will conclude with the words of Moritz Schmidt in his preface to Besold and Gidionsen's work: "My cures have risen from 2 per cent to 20 per cent. We must continue to struggle in order that the results may be still better. The progress in the surgical treatment under the best aseptic precautions give us hope that this attempt will be successful. Therefore, to further fight along the entire line!"

XLII.

THE INFLUENCE OF ADRENALIN IN THE CAUSATION OF ARTERIO-SCLEROSIS.*

By F. E. Hopkins, M. D.,

SPRINGFIELD, MASS.

Since the publication of Josué's[1] experiments in 1903, considerable literature has appeared upon the subject of adrenalin as a cause of arterio-sclerosis. The marked uniformity in the results of the experiments reported during the four or five succeeding years, apparently established the case against adrenalin. In fact, judged by the influence upon the minds of many who read these reports or who saw references to them, the case was proven, since they hesitated to employ the agent or countenance its use. Later investigations have cast much doubt upon, if they have not entirely disproven the conclusions of these early observers; and that these later and more accurate reports may have as wide a dissemination as possible, I am led to ask your discussion of the subject, since your experience also with the use of adrenalin will be reassuring. Adrenalin has proven so useful and valuable an agent in our hands, both in allaying acute congestions and in affording a bloodless field for operation—not to mention other merits—that any suggestions of its responsibility in causing grave remote effects like arterio-sclerosis, arouses in one a feeling of resentment akin to that experienced when reflections are cast upon the integrity of an old and tried friend.

Having no original work to offer, this presentation shall be brief, yet that it may have somewhat of symmetry and historic sequence, reference will be made to some of the published observations, in the order of their appearance.

The attempt to produce arterio-sclerosis experimentally is not new, and a variety of methods have been employed to that

*Read at the Thirtieth Annual Congress of the American Laryngological Association, held in Montreal, May, 1908.

end; such as the direct mechanical injury of the vessel walls, the intravenous injections of micro-organisms or their toxins,[2] the subcutaneous injections of nicotine, barium chloride, digitalin,[3] the administration of lead salts and tobacco, as well as the use of adrenalin. Since 1903 experiments have practically been confined to the latter, owing to the interest aroused by the report of Jores, of the Bonn Pathological Institute, who fed animals on adrenalin extract; and the reports already referred to, published by Josué the same year, who made use of adrenalin hypodermically, the injections being repeated daily for varying periods.

Josué's method was adopted by the many experimenters in this country and Europe. Rabbits were used for the experiments, since the vessels of other animals were found resistant to degenerative action.

The reports of the findings of the various workers, including Miller,[2] Pearce and Stanton[4] in this country, Oscar Klotz[5] in Canada, Erb in Germany, Pic and Bonnamour in France, and many others, show a remarkable unanimity, and a quotation from one will serve for all. All agree that the smaller vessels are not involved, and that the media is the layer exhibiting the maximum degree of degeneration. Miles[6] says of the gross appearance of the lesions: "They were in general grayish-white in color, more or less opaque, circular to angular in outline, or sometimes appearing as short lines running lengthwise with the vessel, usually raised above the surface as the vessel was laid open, and varying in size from a pin-point to several millimeters in diameter. The larger areas were often somewhat uneven, both in elevation and outline. Those larger areas of calcification often showed tendencies to aneurismal dilations. Calcification could usually be recognized grossly in the larger lesions, and often in the smaller ones, by the more opaque white appearance of the lesion and by the gritty character when touched with a needle or scalpel. The lesions were more frequently found in the thoracic aorta, especially about the mouths of the branching vessels, often as an aggregation of pin-point areas, sometimes as larger plaques. They were frequently observed in the abdominal aorta and less frequently in the iliac arteries. Here also there was a greater tendency for them to appear about the mouths of the branching vessels, as in the thoracic region."

But he says in the same connection that the gross appearance of the lesions and their location is the same in the injected and in the non-injected animals. Also, that the result of no individual experiment can be predicted with certainty, no matter whether the dose administered be large or small, the duration of the treatment long or short, and he mentions the fact that the vascular system of normal rabbits has not been sufficiently investigated. In the same paper he publishes the statistics gathered by himself and Johnstone. Sixty-one rabbits received injections three times daily in amounts from ½ m. to 15 m. at a dose, and for varying periods. The total quantity administered to each varying from 3 m. to 1350 m. of a 1/1000 solution. The most extensive lesion was found in the rabbit receiving 5 m. doses, 150 m. in all, while many others receiving four to eight times that total showed absolutely no lesion. Of the sixty-one thus treated, seventeen, or 27.86 per cent, showed lesions of the large vessels on post-mortem examination.

They then examined fifty-eight "normal" rabbits, and twenty of these, or 34.48 per cent, were found to have arterial lesions of exactly the same character as the animals treated. These animals were from the same sources, and so far as possible kept under the same conditions as the rabbits experimented upon.

The foregoing report of Miles and Johnstone, together with the admitted fact that it is only in rabbits that vascular lesions have been found, and that it is questionable if the lesions in these animals are identical with arterio-sclerosis in man, together with the statement of all experimenters that they find it difficult if not impossible to produce lesions in young rabbits; that lesions are reported after only two injections (Braun reported by Miller[2]), and calcification as early as the fifth day after beginning treatment, that Klotz[3] found exactly the same results produced by barium chloride, and he states that the similarity is so striking that neither macroscopically nor microscopically can the lesions be distinguished from one another —all this variable and uncertain testimony, I say, throws doubt upon the assumption that adrenalin is the cause of the vascular lesions found after experimentation, and leads to the conclusion that most if not all the changes in the large vessels existed before the experiments were begun.

Practically this same conclusion is reached by Adler, who

read an exhaustive paper upon the subject before the New York Academy of Medicine on March 19, 1908, a paper soon to appear in the *American Journal of the Medical Sciences.* On the same occasion Harlow Brooks read a paper to be published duly in the *Archives of Medicine,* and he reported a case, which goes farther toward proving the innocence of adrenalin under reasonable use, than can any amount of experimentation upon animals, or any theorizing, to prove the contrary.

Dr. Brooks' case was that of a woman thirty-five years old, who was under observation in a hospital for three years. She suffered from asthma to such a degree as to be totally disabled. No ordinary remedy afforded her relief. It was found, long after exhausting the usual list, that hypodermics of adrenalin overcame the spasm and brought relief for a longer or shorter interval. In view of the experimental evidence against adrenalin, its employment was sanctioned only as a last and deperate resort and because it was the only treatment which gave any relief. This patient received at times as much as 120 m. at a dose; and during the three years of its use forty-four one-ounce bottles of the usual 1/1000 solution were given hypodermically. She died after three years, but not from a cause attributable to the adrenalin; and the examination of her arteries revealed only the changes in vessel walls to be expected at her age. Nothing unusual was found macroscopically, but microscopically in the medial coat of the aorta were a few scattered points of degeneration, not sufficient to materially impair the strength of the vessel walls; and the patient might apparently have endured the hypodermics of adrenalin many years longer, had not her life been taken by other disease than that of her arteries.

In a word, then, the unreliability of animal experimentation to date, and the proven innocence of the large doses continuously administered in Dr. Brooks' case, give ample ground for reassurance in the reasonable use of adrenalin.

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3. Oskar Klotz. British Medical Journal, December 22, 1906.
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ABSTRACTS FROM CURRENT OTOLOIC, RHINOLOGIC AND LARYNGOLOGIC LITERATURE.

I.—EAR.

Double Mastoiditis, Sigmoid Sinus and Jugular Thrombosis.

OPPENHEIMER, New York (*Archives of Otology*, Vol. xxxvii, Nos. 3 and 4). A woman, aged 22, suffering from "la grippe," had a spontaneous perforation of the left mt., and four days later the right mt. was incised. Sudden high temperature was accompanied by vertigo, nystagmus, nausea and vomiting. Cerebration was slow. Tuning-fork tests showed diminution of higher tones. A streptococcus infection shown by culture. The left mastoid was opened and sinus exposed. Two days later the right mastoid was drained. Its sinus lay far forward and was wounded by the chisel, but the bleeding was easily controlled. Temperature 104° F., white blood count 19,000, polymorphonuclears 86%, five colonies of streptococci in each c. cm. of blood. The patient complained of chilliness, was restless, had headache and nausea.

On account of finding streptococci in the blood it was determined to open the sinuses. On the left side the sinus was uninvolved, on the right the wall was thickened and striated. On incision there was no free bleeding for some seconds, then it followed by a free gush. No thrombus was found, it being evidently washed out.

Temperature for the next three days was practically normal, yet blood cultures taken on the successive days showed increase in the number of colonies of streptococci from five to sixty to each c. cm.

Being preceded by a chill the temperature suddenly rose to 103.8° F. The right internal jugular vein was then exsected from clavicle to bulb. A series of enlarged glands were also removed. Above the facial the jugular vein was white, flat and densely adherent, while examination showed the presence of streptococci. From this time the patient made an uneventful recovery. A blood culture three days later was sterile. *Campbell.*

Case of Recurrent Keloid of Scalp and Lobule of Ear.

COCKS, New York (*Archives of Otology*, Vol. xxxvii, Nos. 3 and 4). A man, aged 42, with multiple keloids. Four operations have been done and still they recur. Electrolysis and thiosinamin injections have been suggested for their removal.

Campbell.

Report of a Case of Mastoiditis, Complicated by Purulent Meningitis, Encephalitis, Phlebitis of Sigmoid Sinus, Jugular Bulb and Internal Jugular Vein. Operation. Recovery.

MCKERNON, New York (*Archives of Otology*, Vol. xxxvii, Nos. 3 and 4). A man, aged 20, had an acute otitis media suppurativa with spontaneous rupture of the mt. At the end of five days pain recurred and the mt. was incised.

The head pains increased in severity and were accompanied by vertigo and vomiting. The pupils were irregular, the left being the smaller, pulse 100, temperature 104.4° F., respirations 24.

The right mt. bulged. The posterior-superior canal wall was collapsed. Pressure over the mastoid and tapping the skull caused him to cry out with pain. A smear of the ear discharge showed the diplococcus intercelularis meningitidis. The leucocyte count 11,600, with 94% polynuclears.

The entire mastoid was found infiltrated and was removed from the zygomatic ridge anteriorly to a point posteriorly which exposed the entire descending limb of the sigmoid sinus, as well as dura over a portion of the cerebellum. This removal exposed the entire floor of the middle fossa in this region. The dura bulged and was intensely red. On incising the dura several drachms of turbid fluid were evacuated, which contained the same diplococcus as that from the smear. For seven days following the operation the patient was unconscious, with all the symptoms of typical meningitis. During this time several lumbar punctures were made, and fluid withdrawn showed the same diplococcus as in the other examinations. The pupils were unequal throughout the entire seven days. On the eighth day consciousness returned and the ice-caps were removed. On the ninth day the patient was chilly. The temperature rapidly rose to 104.8° F. Tenderness developed along the anterior border of the sterno-mastoid and some enlarged glands could be felt.

The sinus was again exposed from a point one and three-quarter inches posterior to the knee above down to the bulb below. About the center of exposure the sinus was freely incised and a few drops of pus exuded, but there was no bleeding. The internal jugular was resected from skull to clavicle. Its lower two inches contained fluid blood, while above this was clot. The contents of the sinus were now evacuated and working backward towards the torcular a firm clot was found completely filling the lumen of the vessel; upon its removal a free hemorrhage was established. Sufficient bone was removed to permit the passage of a curette into the bulb and by little manipulation free hemorrhage was here established, the origin of the blood being, of course, from the petrosals. There was considerable sloughing of the posterior sinus wall extending as far back as the cerebellum, and this was removed by scissors. During the healing process there was a good deal of trouble with a hernia cerebelli until the entire exposed cerebellar cavity was mopped with a cotton-tipped probe dipped into a solution of silver nitrate 480 grains to the ounce. This occasioned an abundant slough, but there was no further protrusion. The neck wound healed kindly, and one year later the hearing on the affected side was normal.

Campbell.

A Case of Sinus Thrombosis, Following Removal of Granulation Tissue from the Middle Ear; Excision of the Internal Jugular Vein; Recovery.

DENCH, New York (*Archives of Otology*, Vol. xxxvii, Nos. 3 and 4). Although not ordinarily supposed to be a dangerous operation, Macewen long ago called attention to the fact that removal of granulation tissue from the tympanic cavity might lead to serious intracranial involvement by opening up new avenues of infection through the freshly-cut surfaces.

The author's case is that of a young girl, who had a purulent discharge from the right ear since early childhood. Of late there had been gradually increasing pain, headache and sleeplessness. The meatus was almost completely filled with granulation tissue and the mastoid somewhat tender. Under general anaesthesia the granulations were removed and the temperature suddenly rose 5½° F. It fell to normal next morning, but the evening temperature was 106° F. As there

was evidently an infective sinus thrombosis a radical mastoid operation was done. A firm clot was found in the sinus, which was removed by curette, but as no bleeding came from the region of the bulb, the internal jugular vein was excised. Microscopical examination of the clot showed a streptococcus infection.

Ten days after the radical operation the cavity was lined with a Thiersch graft and the posterior wound closed.

Campbell.

Report of Cases of Mastoiditis in the Aged.

ALDERTON, Brooklyn (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4), reports seven consecutive and unselected cases in five of which there was no perforation of the mt. or discharge, while in two there was perforation with granulations and purulent discharge.

In the majority there was no marked systemic disturbance; headache, neuralgias, sleeplessness and tinnitus being the symptoms mostly complained of. The inflammation was low grade and long duration, attributable to the lessened tendency to reactive inflammations, which pertains to advancing years. This was noted in the resistance of the coverings of the brain and its sinuses to the septic foci in direct juxtaposition.

Campbell.

Do Not Remove the Thrombus.

VOSS, Riga (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4). In cases of suspected sinus thrombosis from the moment one begins exposing the sinus, bear in mind that unnecessary manipulation is highly injurious, because dislodging portions of the thrombus into the general circulation will cause metastases.

Do not palpate. Do not remove the thrombus. Make a diagnosis by the eye and aspirating syringe. On aspirating the sinus contents one can often obtain a half gram of dark fluid, which when squirted out on a white background is recognized as brownish-red and not venous colored. On diagnosis being made the jugular is ligated and divided and the sinus is freely exposed and incised, going 1—1½ cm. into healthy parts. The entire outer wall of the sinus is cut away with scis-

sors so that the thrombus is exposed, but it is allowed to remain in situ. Free drainage of the infectious material is now assured, and the thrombus is left to its fate. *Campbell.*

Eustachian Catarrh with Hyperinflation; Report of a Case.

BRAISLIN, Brooklyn (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4). A young man experienced a sensation of fullness in the ears, and slight dullness of hearing with each act of swallowing or on talking. There was likewise a sensation when speaking of talking in a resonant space. These symptoms have persisted since an attack of rhinitis one year ago.

While talking he "sniffs," as this gives temporary relief, but only until the next act of swallowing, speaking or chewing. Posterior rhinoscopy shows hypersecretion at the mouths of the Eustachian tubes. Valsalva's experiment exaggerated the symptoms. Removal of the posterior ends of the inferior turbinates overcame the difficulty. *Campbell.*

A New Instrument for the Treatment of Diseases of the Ear.

FOWLER, New York (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4). The apparatus consists of a glass bell, which incloses the ear and fits closely to the tissues round about. From the center of the top of the bell a nipple projects for attachment to the fountain syringe tube, while projecting inward from the nipple is a nozzle to which soft rubber tubing is attached for passage into the external auditory meatus.

On the circumference of the bell is placed an outlet nipple to be connected with rubber tubing for drainage into a low receptacle. This outlet tubing exerts suction action. The fountain syringe fastened at a point two feet above the head will give the ordinary safe nozzle velocity. *Campbell.*

Otitic Sinus Thrombosis and Pyemia.

ALEXANDER, Vienna (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4). Otitic sinus thrombosis is caused by infection of the sinus contents by continuity or metastasis from middle-ear suppuration. The infection may be imparted to the entire body from the diseased sinus and this is the time when the pyemia and the bacteremia begin. Usually bacteremia in a few days results in death, whereas pyemia leads to metastatic, purulent inflammations.

According to the position of the metastasis we distinguish four kinds of otitic pyemia, viz.: intracranial, thoracic, abdominal, articular and in the muscles; of these intracranial metastases is by far the most frequent.

The symptoms of sinus thrombosis are substantially those of pyemia—intermittent fever, chill and spontaneous pain. There is usually a sudden change in the amount of middle-ear secretion; it either stops or greatly increases and flows continuously.

The operative indications are:

1. Removal of the focus of infection.
2. To confine the pus to the ear, thus preventing the formation of metastasis.
3. The establishment of good drainage.

One always begins with ligation of the jugularis about its middle third; when it contains a thrombus it is cut through and the upper end sutured to the upper angle of the neck wound. The vein below this is laid open until well beyond the thrombus. This ligation is done so that in immediate operation on the ear one is not afraid of dislodging particles of thrombi during the jarring produced by chiselling and there is no danger of air aspiration in opening the veins and sinuses. When the sinus region is sufficiently exposed in the radical operation, the sinus sigmoideus is incised 2 mm. in length with a scalpel. If there is no hemorrhage the sinus is cut longitudinally and the thrombus first removed from the peripheral end, and then from the central end and the bulb. Aspiration of sinus contents does not furnish a reliable result, for with a parietal thrombus fluid blood can be aspirated. In such a case after incising the sinus with a scalpel, the blood is apt to flow with diminished force. We cover the incision for a few minutes with sterile gauze and then frequently find the thrombus in the gauze, it being loosened and carried there by the flow of blood. In all cases every attainable thrombus must be removed. *Campbell.*

The Present Status of the Radical Mastoid Operation for the Cure of Chronic Purulent Otitis Media.

WENDELL PHILLIPS, New York (*Medical Record*, Oct. 10, 1908), states that permanent cessation of the purulent discharge does not take place in more than about 65 per cent

of the cases operated upon, even in the hands of the most skillful operators. Many of the remaining have but intermittent discharge or are victims of reinfection, others throw off cholesteatomatous masses, and still others are victims of further extension of the necrotic process. These statistics show that the end results are less rosy than the first enthusiasm seemed to imply.

The radical operation is indicated: (1) When a permanent cessation of the purulent process has not been effected by prolonged local intratympanic treatment, combined if necessary with such minor operations as removal of granulations, enlarging perforation, etc. (2) When the cure has not been effected by the removal of necrosed ossicles and the curettage of the middle ear. (3) When acute symptoms of mastoiditis are present. (4) When a sudden cessation of the pus discharge produces vertigo, pain, or other unusual symptoms. (5) The appearance of facial paralysis during the course of chronic purulent otitis media. (6) Attacks of vertigo, indicating that the necrotic process involves the labyrinth. (7) In all cases where intracranial or lateral sinus involvement has already appeared. (8) Where there are positive symptoms of cholesteatoma in the mastoid antrum. (9) Where there are fistulous openings in the cortex of the mastoid process or in the osseous canal wall. (10) Whenever extreme depression or other symptoms of disturbed mentality accompany the disease.

The operation is contraindicated: (1) When the purulent process is tuberculous and accompanied by advanced general tuberculosis. (2) In advanced pernicious anemia or albuminuria and in cachectic diabetes. (3) It is usually contraindicated in young children. (4) In all cases where the disease is confined to the ossicles and tympanic cavity. (5) In adults who have scanty otorrhea without odor, with improper opening of the drum membrane, behind which are retained masses of secretion. (6) In all cases where it is possible to effect a cure by any of the other methods.

He advises against the radical operation in young children for the following reasons: (1) The disease is rarely of sufficient extent to require it. (2) The disease usually yields to local treatment, providing diseased tonsils and adenoids are removed. (3) By establishing free drainage, through a large

perforation, with well maintained local treatment, a cure usually results. (4) The natural recuperative powers of childhood may bring about a cessation of the discharge, whereas there is the danger of partially or wholly destroying the function of hearing, with the train of misfortunes which follow.

Richards.—

Chronic Otitis Media Purulenta.

ALFRED WIENER, New York (*Medical Record*, Nov. 7, 1908). Proper drainage and conservative measures, followed by ossiculectomy, should precede radical treatment. The author's experience has been that in those cases in which conservative measures are attempted with success a great deal more is to be expected and can be promised than when the radical operation is performed.

When this is performed, a cure will be established in many cases, while in others, in spite of the operation, the hoped-for cure will not be brought about. *Richards.*

Cerebral Abscess.

EMIL AMBERG, Detroit, Mich. (*Journal A. M. A.*, Aug. 22, 1908). Patient was a girl of about 12 years of age, whose ears began discharging soon after birth. Diagnosis of sinus thrombosis was proved by operation. Thrombosis removed. Child did not do well. Second operation nine days later. Internal jugular vein first tied, then the middle cranial fossa opened and about two drams of yellowish-green pus evacuated. Death eight days later.

The deep-seated brain abscess was probably old, the child having been subject to occasional violent attacks of pain in the head, intensified when she blew her nose. *Richards.*

Nasal Analgesia as a Prognostic Symptom in Dry Catarrhal Deafness.

DUNBAR ROY, Atlanta, Ga. (*Journal A. M. A.*, Aug. 29, 1908), has found that many of his patients consulting him for progressive deafness presented at the same time a condition of manifest nasal analgesia, by which he means manifest insensitiveness of the nasal mucosa, allowing one to accomplish all kinds of instrumental manipulations in these cavities with-

out discomfort to the patient and without the use of any local anesthetic. This analgesia is also present in the ear itself. He has not yet determined whether the same condition that exists in the cases of progressive deafness is also present in the sensitive nerve terminals, but is convinced that the same conditions are present in the mucous membrane in the nose, nasopharynx, Eustachian tube and middle ear; and the more advanced these changes in the mucosa and nerve terminals are, the less favorable is the prognosis for the improvement of hearing. These same degenerative changes also finally take place in the auditory nerve itself, as is evidenced by the tuning-fork test and the histopathologic investigations of Moos, Politzer, Gruber and others. *Richards.*

A Report of a Case of Brain Abscess Associated with Chronic Purulent Otitis Media, with Special Reference to the Operative Technic Followed.

JOHN RANDOLPH PAGE, New York (*American Journal of Surgery,* September, 1908). Patient was a child of six years and first complained of headache, then vomiting and convulsions, first supposed to be due to intestinal disturbance, but later thought to be due to the ear. The right ear discharged, and 24 hours after admission to the hospital the veins in the fundus of the right eye were more swollen and tortuous than in the left and the edges of the disk more blurred. The mastoid and squamous portions of the bone being exposed, an opening into the cranium, large enough to admit of using a rongeur, was made with a gouge, and the tegmen antri and tympani were removed. They were softened by necrosis, but there was no perforation. The antrum and middle ear were filled with necrotic material and foul pus. The bone covering the outer aspect of the temporosphenoidal lobe was removed upward for little over an inch, forward for an inch and backward for about three-quarters of an inch. There were no granulations or lymph on the dura or any tract of infection discovered. Its tension was plus one or over. A narrow straight bistoury was introduced into the brain, upward just above the tympanum and then over the antrum, with negative result. Three rows of punctures, three or four punctures in each row, were then made, one-third inch over each other, but no pus was found. More bone was then removed anteriorly

for one-quarter of an inch or more and three more punctures made the same way. Still no pus. Bone was then removed posteriorly, and after two unsuccessful punctures the bistoury was introduced almost straight in, just above the angle made by the entrance of the petrosal into the lateral sinus, and on slowly removing the knife there was a flow of pus. A half inch crucial incision was then made in the dura at this point, followed by a discharge of pus. In the absence of an encephaloscope, a large-sized Gruber ear speculum with a gauze obdurator was carefully introduced just within the incision, the obdurator removed, and the pus that appeared in the speculum was wiped out with absorbent cotton. This was done a number of times, until about half an ounce of pus was removed. The opening in the dura was held open with gauze packing, a small wick of gauze having been carried into the opening in the brain as far as could be seen and left there. The anterior part of the wound was sutured. The dressing was changed twice a day for four days, but as the abscess seemed to drain well, the wick was not changed until the second day, when it was carefully removed and replaced, being changed every day but not removed entirely until three weeks after the operation. A small hernia about the size of a hazel nut followed the operation, but at the end of four weeks it was completely closed off and the whole area presented a uniformly granulating surface.

The author does not believe in introducing the finger into the brain, and regards tubes and rubber tissue more unsatisfactory for drainage than gauze. *Richards.*

Tuberculosis of the Ear.

W. Sohier Bryant, New York (*Medical Record,* September 26, 1908). The middle ear inflammation presents a peculiar picture. One sees an indolent, serous or sero-purulent, more rarely a purely suppurative, inflammation, melting away of the drum membrane, multiple or kidney-shaped perforations, exposure of the manubrium mallei, etc. Continuation of the ulcerative process in the face of ordinary treatment is pathognomonic of tuberculosis, especially alternating increase and decrease of the activity of the process independent of other obvious causes. Tympanic tuberculosis is a very early sign of a more general infection and also gives an accurate indication

of the course of a concomitant pulmonary tuberculosis. The author has found the pyoctanin dry treatment to be the most efficacious. *Richards.*

Report of Two Interesting Cases of Mastoiditis.

J. H. CRAWFORD, Atlanta, Ga. (*American Journal of Surgery,* September, 1908). Two cases of primary mastoiditis are reported. The first was an acute case of traumatic origin, as a result of injury from a piece of copper ore. The second occurred in an infant of eleven months, and was apparently primary mastoiditis, as there was no discharge from the ear and the child had given no evidence of being in pain. The tip cells were large and broken down. Operation was done in both cases, with rapid and uneventful recovery.

Richards.

The Myth and the Mystery of "Meniere's Disease."

GEORGE M. GOULD, Ithaca, N. Y. (*Medical Record,* Oct. 31, 1908). At the end of a fifteen-column article, reviewing very much at length much of the past literature of Meniere's trouble, the author reaches the following conclusions:

"Meniere's Disease" is simply "migraine," or sick headache, with many symptoms ignored and with three of the secondary or incidental effects of migraine over-emphasized:

(a) Vertigo.

(b) Tinnitus (a) of a purely functional neurotic nature, a reflex-ocular neurosis to the center or to the organ of hearing; (b) of traumatic origin, caused by vomiting.

(c) Partial or complete deafness, due to injuries in vomiting.

Migraine is one of the evil effects, the most common and the most important of eyestrain, always preventable, almost always curable by scientific spectacles, because in almost one hundred per cent of cases it is due to ametropia.

Richards.

Acute Otitis Interna, with Report of a Case.

EDGAR R. STILLMAN, Troy, N. Y. (*Medical Record,* October 3, 1908). References to this condition during the past twenty-five years are few and incomplete, as the patients

always recover. A perfectly well child is seized suddenly with vomiting, headache, occasionally with earache, high fever and sometimes with a convulsion. In three to eight days the force of the disease has spent itself, but the child is completely deaf. It gets well completely with the exception of a staggering gait, but remains deaf. The keynote to the diagnosis is early and complete deafness, with rapid recovery in a child whose symptoms indicate some acute intracranial inflammation. A case is reported in a child of seven years who was sent home from school because of headache, pain over the right eye and feverishness, following slight delirium the previous night. Objective examination was negative, and there was nothing to cause suspicion of any trouble with the ears or of the vital processes. Temperature 103°. A restless night followed and there was prostration the following morning, the child being only aroused by shaking and then would glance around in a strange sort of way and close his eyes again. He would not answer questions and seemed not to comprehend their meaning. Fever had subsided somewhat and he slept all the time, except when roused for medicine or nourishment. Next day it was discovered that the boy was totally deaf. There was no pain or soreness about the ears. Examination with the tuning fork showed absolute loss of both aerial and bone conduction. No evidence of any other cranial nerve involvement. He was still a little feverish, but his general condition seemed to be somewhat improved. He could recognize objects and could read as well as usual. Next day he played in bed, but was still absolutely deaf. At the end of the week he staggered on attempting to walk and had a gait resembling cerebellar ataxia or that of a drunken man. Twenty-five days later the child was apparently as well as ever, but totally deaf.

The etiology of this disease is very obscure, and diagnosis is only possible after the characteristic symptom of total deafness has developed. Prognosis is invariably favorable as to life. *Richards.*

Ear Symptoms of Cardiovascular Disease, with Special Reference to Low Pressure Cases.

Louis F. Bishop, New York City (*Journal A. M. A.*, November 7, 1908), thinks that there are certain cases of tinnitus aurium which are a local manifestation in the general circu-

latory disorder, which may have its foundation in arterial sclerosis, but which is often in a large measure functional so far as the blood vessel disorder is concerned. It is found in connection with high blood pressure and also with low, and while in both instances the symptom is relieved by measures which regulate the circulation, the most striking results of treatment are to be obtained in cases of low arterial tension.

He thinks that otologists should make observations of blood pressure, so as to detect gross departure from the normal, and he has devised a method by which this can be done in a very few seconds.

In the way of treatment the most important element is systematic exercise. Iron and arsenic are of value as internal medicines. *Richards.*

Distinct Pulsations in a Non-Perforated Membrana Tympani.

MAX FIEDLER (*Archiv. f. Ohrenheilk.*, Bd. 76, Heft 3 u. 4, 1908, p. 256) reports a case of a woman 48 years old, who for two years had had subjective tinnitus in the left ear. On the left side a marked central retraction of the drum was seen and in the anterior upper quadrant a pulsation synchronous with the radial pulse, producing at each beat two reflex lights. In the right ear a similar pulsation could be seen, but it was placed more centrally and somewhat deeper. Contractions of the arteries of the neck caused disappearance of the phenomena. It remained unaltered after catheterization and the use of the Siegle's speculum.

Wood.

The Employment of Hot Air in Otology.

FERRAN (*Revue Hebdomadaire de Laryngologie, D'Otologie*, August 8th, 1908) has used hot air in the treatment of diseases of the ear for the last two and a half years. His results have been so encouraging that he feels it is a valuable means of treatment in many cases. A chief objection in the past to the use of hot air has been the lack of a simple apparatus. This, the author states, he has overcome by the use of a simple Politzer bag, prolonged by a muff of aluminum containing an electric rhostat. With this in from four to five minutes a temperature of 70 to 80 degrees C. to be obtained. The apparatus permits the use of the catheter as well as the

Politzer bag. (The author gives credit to America for the idea of the apparatus.) The abstractor has not seen this particular instrument. He has had, however, entire satisfaction with that made by Wappler Brothers, New York, with which the same amount of heat can be obtained in a much shorter time. Ferran is in the habit of giving two treatments a week, occasionally, however, making them daily. He has used it in 217 cases. While in cases of pure otosclerosis, he admits failure, as far as cure of the disease is concerned, he has been able to give relief to many of the accompanying symptoms. In cases of chronic middle ear disease with more or less stenosis of the tube, he has gotten his best results. Here, as shown in several of the reports which he gives, he has succeeded in not merly relieving the tinnitus, but also improving the hearing. He has noticed a rapid disappearance of the ear symptoms which have followed an attack of acute rhinitis, especially if it was of a grippe variety. In acute inflammation of the middle ear with perforation, benefit has been noticed from the use of hot air, probably through its effect upon the Eustachian tube, and in certain forms of middle ear suppuration he has also obtained benefit. Here he has used the hot air in the middle ear directly through the auditory canal. The beneficial results obtained are to be explained in his opinion to the effect on the mucous membrane of the tube of the naso-pharynx similar to that produced by cocain or adrenalin.

Harris.

Case of Double-sided Necrosis of the Inner Organ of Hearing, With Fatal Hemorrhage From an Aneurism of the Internal Carotid.

C. E. BENJAMINS (*Archiv. f. Ohrenh.*, 3 und 4 Heft, Bd. 76, 1908, p. 240) reports a case in which arsenic had been applied to the external auditory meatus for ear trouble. Necrosis of both petrous bones followed, and associated with this was paralysis of both facial nerves. A radical operation was performed, under chloroform, on both sides, on July 21st. The patient for a while did well after the operation, but on August 25th and afterwards at irregular intervals, severe hemorrhage occurred from the right ear. A diagnosis was made of venous hemorrhage, probably from the jugular bulb. As the patient was very anemic, immediate operatior

was decided upon, and the transverse sinus was packed and the jugular vein tied. Nevertheless, on the night following the operation the patient died from sudden hemorrhage. The post mortem examination showed extensive necrosis of the petrous pyramid, aneurism of the internal carotid artery with thrombosis and rupture, also very poor development of the right transverse sinus and enormous dilatation of the left.

Benjamins says that in cases where hemorrhage of the carotid is diagnosed the best treatment is packing of the middle ear after a radical operation, combined with tying of the common carotid artery. Simple ligation of the carotid does not prevent a return flow from the circle of Willis, and it is difficult by packing alone to absolutely check a carotid hemorrhage. It must be remembered, however, that ligation of the common carotid is often accompanied by hemiplegia and other brain disturbance, ten per cent being fatal.

Wood.

Histology of Suppurative Processes in the Labyrinth.

E. RUTTIN (*Beiträge z. Anat. Phys. Path. u. Therap. d. Ohres. Nas. u. Halses,* Bd. 1, Heft 5 u. 6, 1908, p. 388) examined 3 cases of suppuration of the labyrinth, probably tuberculous in nature. In all three cases the pus entered the perilymphatic space by way of the posterior wall of the promontory, breaking into the scala vestibuli. From a study of these cases, and a rather extensive review of the literature of the subject, he deduces the following conclusions:

1. Circumscribed chronic suppuration of the perilymphatic space of the vestibule produces by gravity an associated disease of the perilymphatic space of the scala vestibuli, involving the lower half of the first turn.

2. This is followed by a peculiar ectasis of the ductus cochlearis, giving to it a pyramidal or vault-like shape. If a rupture takes place into the endolymph, the point of the rupture is always placed in the dependent portions of the membranous labyrinth (sacculus, ductus reuniens, cecum vestibularis or the vestibular portion of the ductus cochlearis).

3. A chronic circumscribed suppuration of the first turn, on account of gravity, may be sharply localized in the lower half of the turn.

4. A chronic circumscribed suppuration of the scala tym-

pani, produced by a rupture through the round window usually remains limited to the same, if the basal membrane is thick. If a rupture takes place its location is in the basal membrane.

5. A very important fact from the clinical side is the difference in importance of the location of the seat of rupture into the labyrinth. If the suppuration breaks through into the vestibule the mechanical relations bring about an associated disease of the cochlea. Suppuration which finds its way to the labyrinth through the round window, likewise for mechanical reasons generally remains limited to the lower half of the first turn of the cochlea. Therefore, the prognosis for the function of the labyrinth is much less favorable if the rupture takes place into the vestibule, because every time in these cases the entire labyrinth becomes diseased; while on the other hand the favorable prognosis of rupture through the round window is because of the limitation of the infection through a small portion of the cochlea.

According to many authors, suppuration following rupture through the semi-circular canals is still more favorable.

Wood.

Concerning the Clinical Aspect of Labyrinth Suppuration.

FRANZ NUERNBERG (*Archiv. fur Ohrenheilkunde,* 1908, 76 Band, 3. u. 4. Heft, p. 139, 230) reports 26 cases of secondary affection of the labyrinth occurring in 3,695 cases of suppuration of the middle ear. Each case is reported in considerable detail. In conclusion he says that:

1. The large majority of fistulae of the semi-circular canals arise through erosion of the semi-circular canal from the outside and are mostly circumscribed lesions.

2. It is possible to have a primary circumscribed suppuration of the labyrinth with the retention of hearing, and, therefore, the presence of hearing does not exclude a suppuration of the labyrinth, especially if the suppuration is limited to the vestibular apparatus.

3. It is not possible to distinguish accurately between the irritation and paralytic phenomena of the vestibular apparatus, as suggested by von Stein and Hinsberg.

4. Suppuration of the labyrinth is not always accompanied by disturbances of equilibrium, and in relation to this it is

worthy of note that a negative result of Hinsberg's modification of Stein's test is not a positive indication that the labyrinth is intact.

5. A positive Barany's test of the vestibular apparatus proves that the vestibule is functionally active, but it must be remembered also that when this organ is markedly involved, the Barany's test may still be positive though the reaction is a very slight one.

6. If we exclude the cochlea, the disease of the labyrinth can only be diagnosed when the hearing becomes rapidly diminished at the beginning of the disease, or during our observation, and finally sinks to complete deafness.

7. The vestibular apparatus is much more resistant to the inflammatory process than is the cochlea.

8. Fistulae of the semi-circular canals are not always signs of an active inflammation of the labyrinth; quite frequently they are the residuum of a healed labyrinthitis. In such cases, symptoms of labyrinth involvement may be induced by pressure of cholesteatoma, and disappear when these masses are removed. *Wood.*

Histologic Studies Concerning the Changes in the Tympanic Wall of the Labyrinth, Following the Radical Operation for Cure of Middle Ear Suppuration.

Erich Ruttin (*Arch. f. Ohrenh.*, 1 u. 2 Heft, Bd. 76, 1908, p. 81). Ruttin's research was based upon the histologic findings in 25 cases of chronic middle ear suppuration, on all of whom the radical operation had been performed. With the exception of 4 cases they all died from intracranial complications. The most frequent change in the epithelium is the formation of cysts which in the larger majority of cases result from the displacement of tissue by the operation. These cysts the author divides into four types. The first type, which has already been described by Politzer and others, is due to the projection of folds of inflamed mucous membrane which coming in contact with each other, form a sort of enclusion cysts, lined on all sides with mucous membrane. They may be formed on any part of the tympanic mucosa except that covering the membrana tympani. While these cysts may occur in unoperated cases of otitis media they are much more common after the radical operation. The more thorough the curetment, the less liable is the formation of this variety of

cysts. The second variety of cyst results from failure to remove the mucosa from the depression of the oval window. They are generally three-cornered in shape, with the point of the triangle generally turned towards the insertion border of the stapes. Although these cysts occur in non-operative cases of chronic suppuration, they are more frequently seen after operation on account of the curetment pushing a tag of mucous membrane over the edge of the depression of the oval window. This second variety of cyst may be lined either with a cylindrical epithelium containing goblet cells, or with a metoplastic epithelium of squamous cells. Frequently there is a third variety of cyst formed in the round window, due to the over-growth of the surrounding mucous membrane. This over-growth may take on the form of a pedunculated polyp, or a solid tumor of granulation tissue, which grows over the round window, and because of its uneven surface becomes irregularly attached, the spaces between the attachment forming occlusion cysts. The fourth variety of the cyst-like formation is due to a rapidly growing epithelium spreading over a depression which is already filled with pus.

Beside the cyst formation, there is frequently found some pathologic change in the foot-plate of the stapes, in the annular ligament, in the membrane of the round window, in the base of the promontory, and finally in the cellular spaces of the lateral pyramidal wall. The foot-plate of the stapes may be dislocated either towards the vestibule or towards the tympanic cavity or it may be completely or partially absent. If the infection passes through the oval window a circumscribed inflammation is very apt to become changed into a diffuse infection of the labyrinth. The round window acts much less frequently as a port of entrance for infection to the labyrinth than does the oval window. In ordinary suppuration of the middle ear, inflammation of the labyrinth takes place almost always through these two. If cholesteatoma or tuberculosis is present the penetration may take place through the promontory or the lateral wall of the semi-circular canals.

Infection of the supra and intralabyrinth cells is generally a chronic suppurative infiltration, with granulation tissues growing into the medullary tissue of the bone. This can under certain conditions lead to the sequestration of the entire labyrinth. *Wood.*

Intracranial Disease of Otitic Origin.

H. E. KANASUGI (*Monatsschrift f. Ohrenheilkunde*, etc., vol. 42, Heft 5, p. 238) reviews the literature on the subject and reports the result of his own postmortem examinations in 13,400 necropsies. Intracranial disease of otitic origin was found 42 times.

1. Variety of ear diseases. Otitis media purulenta acuta, 6 cases; Otitis media purulenta chronica, 30 cases; Otitis media cholesteatomatosa, 2 cases; Otitis media purulenta chronica and Labyrinthitis purulenta, 4 cases.

2. Variety of lesion in brain. Cerebral abscess, 14 cases; Cerebellar abscess, 6 cases; Cerebral and cerebellar abscess, 2 cases; Cerebral abscess and meningitis, 5 cases; Cerebral abscess and sinus disease, 4 cases; Sinus disease, 5 cases; Meningitis, 4 cases; Cerebellar abcess and meningitis, 1 case; Sinus disease and meningitis, 1 case.

3. Sex. In the 42 cases, 31 were men and 11 women.

4. Age. Greatest number occurred between 10 and 30 years. Seventeen of the 42 cases occurred between 10 and 20 years.

Twenty-seven of the forty-two cases occurred on the right side and fifteen on the left side. *Wood.*

Facio-Hypoglossal Anastomosis.

GEORGE F. COTT, Buffalo, N. Y. (*The Journal of the A. M. A.*, August 8, 1908). This article gives the detailed technic of the operation, with numerous drawings, and should be read in its entirety. *Richards.*

Thrombosis of the Lateral Sinus.

PHILIP HAMMOND, Boston (*Boston Medical and Surgical Journal*, Sept. 24, 1908). Five cases of thrombosis of the lateral sinus, all operated on successfully, are reported.

Richards.

The Cochlea and Its Sensitiveness to Tone Impressions.

W. SOHIER BRYANT (*Archiv. f. Ohrenh.*, 1 u. 2 Heft, Bd. 76, 1908, p. 44) from a study of cases which he has collected from literature, does not seem to arrive at any definite facts concerning the functional tests of the internal ear. He says in

conclusion, that the reported protocole of functional examinations and the following post-mortem findings is lacking in sufficient detail to arrive at definite conclusions, but it seems to indicate that the different parts of the cochlea are not limited in their sensitiveness to tone, and that each part exercises its function for all tones without distinction.

Wood.

II.—NOSE.

The Surgical Treatment of Orbital Complications in Diseases of the Nasal Accessory Sinuses.

ARNOLD KNAPP, New York (*The Journal of the A. M. A.*, July 25, 1908). The orbital complication referred to is the subperiosteal abscess. In the acute cases the local symptoms are those of an acute abscess with cellulitis. In the chronic variety there is more or less defect in the bony orbital wall of the frontal and ethmoidal sinuses, and with the orbital periosteum a large abscess cavity is formed, causing marked exophthalmos. In the chronic cases of exophthalmos and in other cases with acute perforation which do not improve on the restoration of intranasal drainage, the method of operating is, first to remove the anterior half of the middle turbinate a day or two before the external operation; second, under morphin-ether narcosis, make an external incision along the upper orbital border midway between the eyebrow and the bony orbital margin, then down along the inner wall and side of the nose to the floor of the orbit. Divide the periosteum at the orbital margin above and in line with the cutaneous incision along the nose. Retract the periosteum with a rather sharp elevator, and gently detach the lachrymal sac after the firm adhesion to the orbital margin is separated. Free access is thus given to the roof and the inner wall of the orbit. The pulley of the superior oblique is carefully detached from the trochlear fossa. It is important not to disturb the relation between the tendinous ring through which the tendon passes and the periosteum to which it is adherent. The entire floor of the frontal sinus is then easily removed with the chisel, the diseased mucous membrane curetted, and the bony septa in the frontal sinus carefully eradicated. A portion of the orbital margin can be removed without causing deformity if the

normal curve be preserved. Next resect the nasal process of the superior maxillary, the lachrymal bone and the ethmoidal os planum, so as to give broad access to the ethmoidal labyrinth, which is completely removed with the curette. The anterior ethmoidal foramen is a constant landmark, indicates the base of the skull, and as one proceeds back, shows that the ethmoid becomes broader laterally. The remaining part of the middle turbinate may now be removed and the sphenoidal cavity entered if necessary. As broad an opening into the nose as possible is made in addition to removing all disease, to insure proper drainage. Should the frontal sinus extend unusually high, and the upper limit cannot be curetted from below, the cutaneous flap with the eyebrow is forcibly retracted upward, and a window cut in the anterior bony wall similar to the Kuhnt and Killian methods, leaving a broad bony supraorbital margin covered with periosteum, but only a sufficient amount of the anterior bony wall is removed to treat properly the upper parts of the cavity under direct inspection. Marked subsequent sinking in of the forehead can thus be prevented. The cutaneous wound is not sutured, the soft parts approximate of themselves, and a single wick of gauze is passed into the frontal sinus. Slight packing is introduced if bleeding demands it, which is removed after 24 hours. The patient occupies a partly upright position in bed. The external wound closes primarily. The small opening for the drain is left at the inner orbital angle for from seven to ten days. The nasal cavities are left undisturbed. In some cases diplopia is noticed for a few days, but always disappears. *Richards.*

The Ethmoid Cells at Birth and Their Development During Fetal Life.

E. J. CURRAN (*Boston Medical and Surgical Journal,* Oct. 29, 1908). This paper gives the results of some anatomic studies and the development of the ethmoid, and is based on eighteen dissections. All the nasal sinuses seem to be formed by outgrowths of mucous membrane growing outward for the antrum, upward for the frontal, backward into the sphenoidal turbinate for the sphenoidal, and into the lateral mass for the ethmoidal sinuses. While it has been generally stated that the antrum shows in the fourth month of fetal life, he found in some dissections of fetuses of three to four months the antrum

and ethmoidal sinuses in an advanced stage of development and the beginning of the outgrowths of the sphenoidal and frontal well shown at the same period. As the sinuses grow from the mucous membrane coming from the ethmoidal bone, the antrum should be considered as a large ethmoidal cell, the same as are the frontal and sphenoidal sinuses.

It has been generally stated that the antrum is supplied with filaments of nerves from the second division of the fifth nerve, through Meckel's ganglion, distributing branches to the inner wall of the antrum through bony canals. The author, however, thinks this is probably not true, but that the whole of the nerve supply enters through the ostia of the different sinuses, being carried in by the mucous membrane. He has tried to find that the sinuses are supplied by nerves other than or in addition to those that enter by the ostia of the sinuses, but has failed to find anything beyond the assertion that such is the case. He thinks that the mucous membrane carries its nerve supply with it wherever it spreads. In an examination of a large number of skul's he did not find any cell to contain two ostia, not even a large frontal which spread from side to side with only a partial partition between; when this was the case, there was only one drainage ostium into one side of the nose, which is proof that the cell grew from only one side. The position of the partition between adjacent cells depends upon the quickness of one cell to outgrow another, as seen in the varied partition of the septum dividing the two frontal sinuses. One nearly always outgrows the other, notwithstanding the fact that the frontal bones are closed by a suture in the center, which would seem to mark off the limit of each frontal sinus. One vigorously growing sinus, however, finds no difficulty in trespassing on the area of the other and to such an extent that we find only one frontal sinus opening into one side of the nose, yet so large that it completely crowds out the other, which in these cases remains an ethmoidal cell, and the septum which ought to be a frontal septum is in reality a frontal-ethmoidal septum.

The position of the ostia of these cells depends upon the place at which the mucous membrane begins to bud out, or pit, the favorite place being the upper part of the unciform groove, at the upper part of the groove of the bulla and the posterior part of the superior meatus. The pitting may begin at any part

of the groove between the basal lamella, but these are the favorite places for the formation of the buds.

Most of the anterior ethmoidal cells open into the upper part of the groove of the unciform, the remainder into the groove of the ethmoid bulla. In the upper part of the groove of the bulla are the so-called accessory turbinals; there are three, and between each spring cells, usually three in all, one being the cell of the bulla, which is almost always constant.

In the fourteen babies' heads that were dissected, about the same number of cells were found as in the adult. There were no cells that one could say were certainly sphenoid cells, but in every case one could easily find the future frontal sinus growing up into position. Not only were the cells in number ranging from nine to fourteen found in the eighteen dissections, but the same number and arrangement were found in fetuses of three and a half months, four, five, six and seven months. As growth goes on, the gradual tendency is for the upper turbinates or folds to disappear by the merging of two or three into one. When this does not take place, we have the extra turbinate of the adult.

The method of dissection was to do it from the orbital side, the mucous membrane being carefully dissected from the cell walls and the bone broken off bit by bit so as to expose the whole of the antrum and the ethmoidal cells. The mucous membrane peeled off easily, and with care it was possible to have it stand out uninjured and in the same shape that it was when held by its bony or cartilaginous walls. In this way it could be easily seen into which meatus the cell opened, as each cell was held into the nasal mucous membrane by its stalk-opening, so that it stood out like a grape. *Richards.*

A New Method of External Frontal Sinus Operation Without Deformity.

JOSEPH C. BECK, Chicago (*Journal of A. M. A.*, August 8, 1908). Dr. Beck's method makes use of the osteoplastic flap in the following manner:

A radiogram is first made, so as to outline the sinuses, and from this radiogram a celluloid tracing is made and sterilized, so as to be used during the operation. An incision is made through the skin and subcutaneous tissues through the upper margins of the eyebrows, then downward and inward, as is

usually done in the Killian operation. The saw is then carefully drawn from within outwards a few strokes, so as to sever the bone, but not the periosteum. Care must be taken not to saw through the entire thickness of the bone, as it will readily break when it is inverted downward over the nose. The skin flap is now reflected upward and the periosteal bone flap downward, exposing both sinuses. If only one sinus is to be exposed, the technic varies only in the osteoperiosteal flap, the incision being made within the limits of the frontal sinus septum. The skin flap may be made by making a perpendicular incision from the internal angle of the orbit as high as the radiogram indiates the height of the frontal sinus, within the natural intersuperciliary furrow, or wrinkle.

The diseased mucous membrane is then thoroughly eradicated, but not curetted, the natural opening into the nose enlarged, the anterior ethmoidal cells removed, a large rubber tube introduced, through which is passed a wick, the wicking being loosely folded within the cavity of the frontal sinus, and the other end of the tube passed down into the nose close to the floor, with a small portion of the wicking protruding.

The osteoplastic flap is then replaced, the skin flap brought down and sutured with silkworm gut, using the Halstead subdermal suture with a few horse hairs right over the bridge of the nose. The gauze is removed the next day, and on the third or fifth day the rubber tube is replaced by a silver filigree or gold tube. Douches or strong blowing of the nose should be avoided immediately after the operation. *Richards.*

Report Upon Three Interesting Cases of Sinusitis Associated with Serious Eye Complications.

ALFRED WIENER, New York (*American Journal of Surgery*, October, 1908). These cases illustrate the recent publications of various authors, such as A. Knapp, Posey and Onodi, of the close association which diseases of the intranasal passages, especially that of the sinuses, play in connection with some of the more serious affections of the eye.

In Case 1, there was marked exophthalmus, and on operation an empyema of the frontal sinus and an extradural abscess were found.

In Case 2, absolute blindness followed an attack of rhinopharyngitis. The middle turbinate bone was resected and the

post-ethmoidal cells were curetted first on the right side and then on the left, with evidence of disease at each operation. Vision returned in one eye, but not at all in the other.

The author regards the condition to have been an acute retrobulbar neuritis occurring in the canalicular portion of the optic nerve, brought about through a posterior ethmoiditis on both sides and probably of syphilitic origin.

Case 3 presented complete blindness in a child of nine, following an acute coryza and severe frontal headache. Vision returned in about two weeks after mild local treatment of the nose was instituted. *Richards.*

Histologic Changes in the Nasal Mucous Membrane in Cases of Leukemia, and the Cause of Nasal Hemorrhage in This Disease.

Otto Mayer (*Monatsschrift f. Ohrenheilkunde,* etc., vol. xlii, Heft 5, p. 259) studied histologically the nasal condition of a woman who had died from pernicious leukemia. From a study of this case he says that the nasal bleeding in leukemic people is probably produced in somewhat the following manner: The leukemic infiltration of the mucous membrane produces an itching which causes the patient to dig into the nose, wounding the septal mucous membrane. Because the superficial blood vessels are dilated this injury gives rise to a free flow of blood. Further, the injury, on account of leukemic condition of the tissues, does not heal but develops into an ulcer with considerable loss of tissue. The richness of the blood vessels in the base of the ulcer accounts for the marked bleeding on the slightest trauma. *Wood.*

Extradural Abscess With Disturbance of Speech.

Wilhelm Jansen (*Monat. f. Ohrenheilk.,* etc., vol. xlii, Heft 6, 1908, p. 304) reports a case of a man 21 years old, who came to him September 14th with suppuration of the mastoid antrum. He was treated until September 25th, when operation was decided upon, but the next day, before the operation, he suddenly developed a disturbance of speech which made him apparently unable to understand his surroundings and the nurses, and to give false and incomprehensible answers to questions. The antrum was found full of pus, but no fistula leading to the middle cerebral fossa was discovered. The middle fossa, however, was opened, and

from beneath the dura a tablespoonful of odorless pus was evacuated. The dura was normal. After division of the dura the brain was punctured with a knife in several directions but no pus found. The next day after the operation the patient's general condition was better, although aphasia was still present. The disturbance of speech gradually disappeared in about eight days. *Wood.*

Acute Suppuration of the Sphenoidal Sinus, With Intracranial and Orbital Complication.

G. TRAUTMAN (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reviews the literature of the subject, and reports a case characterized by general septicemia, with empyema of the sphenoidal sinus, in association with purulent rhinitis and purulent phlebitis of the cavernous sinus, with beginning purulent hemorrhagic basal meningitis. A fatal termination occurred after five days' illness, and at the autopsy, in addition to the above conditions, numerous subpleural abscessses of the lungs were found, with rupture into the pleura. There was also swelling of the spleen with clouding and miliary abscess of the kidneys, beginning fatty degeneration of the liver and caseation of the bronchial glands. *Goodale.*

On the Relation of Syphilis to Ozena.

FRESE (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reviews the history of sixty-one cases of ozena with reference to etiology, and finds that in only 26.2 per cent was it possible to demonstrate definitely hereditary syphilis. In the remaining cases a positive determination of the etiology was not possible. Nevertheless, the author believes that a large proportion of ozena cases can be referred to a definite cause, and he regards syphilis as the most probable factor in the causation of the disease.

The explanation of this development may be in the first place a general lowering of the constitution (dyscrasia), or secondly ozena may be regarded as a metasyphilitic affection. Neither of these explanations seems adequate. Finally we might attribute ozena to a direct local injury of the mucous membrane through the syphilitic virus, and this last hypothesis appears to be the most probable one. Syphilitic coryza does not, however, lead in all cases to ozena, and perhaps the

duration and intensity of the syphilitic nasal process is of importance in this relation. Ozena in hereditary syphilis finds its analog in the post-syphilitic ozena, such as is manifested after the tertiary processes in the nose. *Goodale.*

The Importance of the Roentgen Rays in Rhinology.

SCHEIER (*Deutsche med. Wochenschrift,* No. 41, 1908). X-Ray examinations of the accessory sinuses of the nose, particularly the frontal sinus are of great importance, because the presence or absence of the sinus can be determined in this way. It is important to find out in regard to the size of the frontal sinus, how far upward it extends, how far posteriorly and the thickness of the anterior wall.

All these points can often be determined with the fluoroscope alone. X-Ray examinations were also found useful in determining diseased conditions of the accessory sinuses. Repeated examinations showed that a shadow was caused mainly by a collection of pus.

A direct radioscopy should be made first. This shows the lateral position of not only the frontal sinus, with its depth and the thiskness of the anterior wall, but also the size of the maxillary and in the majority of the cases of the sphenoid sinus. In sharply defined pictures, the height of the sphenoid sinus can be determined, and often the semi-circular projection of the sella turcica.

If the patient is then turned around, and the sinuses on the both sides compared, collections of pus can frequently be discovered by the difference in the clearness of the sinuses.

In taking radiographs the lateral position of the head will give the vertical and horizontal dimensions of the sinuses, while an antero-posterior exposure will show the maxillary, frontal sinuses and ethnoid cells separately and sharply defined, as well as the lateral extension of the frontal sinuses, the position of the septum and the separate frontal and orbital recesses.

The sagittal views are taken with the patient in the recumbent position with the face on the photographic plate. The author prefers the sitting position and has had better results. The patient is seated in a strong fixed chair, and the plate, which is covered with black paper, is placed against the fore-

head and nose, and held in position by a few turns of a gauze bandage.

In order to obtain a correct idea of pathologic conditions of the sinuses, it is important to study normal radiographs of the head.

Pus in a sinus shows very clearly on the picture, and even thin fluid contents in the sinuses offer relatively great resistance to the X-Rays. Thick pus will of course give a darker shadow.

Spiess watching the position of the instrument through the fluoroscope, has advocated opening the frontal sinus through the nose with an electrically driven trephine. The dangers of this method are so obvious that it has not been generally adopted.

In conclusion, the author states that skiagraphy as a diagnostic aid has a distinct place in rhinology, and will clear up many conditions formerly obscure. *Theisen.*

A Maxillary Sinusitis and Osteitis.

Moure and Brindel (*Revue Hebdomadaire de Laryngologie, D'Otologie,* January 4th, 1908) believe that all cases of chronic antrum disease, which have resisted medical treatment for three to four weeks should be subject to the radical operation, and recommend the Caldwell-Luc method in the great majority of the cases. In 246 out of 270 operated on by them, the disease was limited to the mucous membrane. This was at times partly inflamed; more or less thickened. In other cases it was degenerated, edematous and with small prominences. At times they found it distinctly polypoid. Finally, in some cases they met with the membrane of the paradental cyst. For all these forms of disease they believe in a thorough curettage. In the remaining 24 cases, disease of the bony wall was present either a simple osteitis or a necrosis, with or without the presence of sequestra, a fungous osteitis, or finally in one case a hypertrophic osteitis. This disease of the bone can depend upon some general diathesis. In 3 of the 24 cases it was shown that syphilis was the cause. In four of these only was was this suspected before. The diagnosis in the other seven was made at the time of the operation or several days following. In cases of syphilitic origin, there is always wont to be an unusually profuse hemorrhage

during the operation, after the removal of the mucosa. It was easy to recognize the inflamed bone. In five of the eleven cases more than simple osteitis was present. In two of these, sequestra were discovered. In one case the sequestra had been the cause of a persistent neuralgia which had defied all attempts at relief. In the three other cases a necrosis of the antrum wall was discovered, on the internal wall in the neighborhood of the infundibulum, and once on the postoral wall. One patient showed a pronounced thickening of all the walls of the sinus. Besides syphilis, the authors point out as other possible causes, virulence of infection of the mucous membrane (three cases); ethmoiditis and sphenoiditis (four cases); presence of mucous polyps in the cavity (one case). Five cases were due to irritation from a paradental cyst. The authors conclude as follows:

First, that the osteitis which accompanies at times chronic suppuration of the antrum is to be regarded as a benign complication. Second, that it is of greatest importance to recognize accurately the cause of the osteitis and to apply the proper treatment. Third, that this osteitis will permit the discovery, in certain cases, of a general unrecognized affection, ignorance of which would be of great disadvantage to the patient, especially if it is of a syphilitic nature.

Harris.

The Present State of the Radical Operation for Empyema of the Sphenoidal Sinus, With Demonstration of a New Instrument.

R. H. SKILLERN (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reports the different methods of entering the sphenoidal sinus, which may be divided into the extranasal and the endonasal. Of the extranasal we have the frontal, maxillary and oral; of the endonasal the direct and the indirect. The writer prefers the endonasal direct method, with previous resection of the middle turbinate, and simultaneous removal of the posterior ethmoid cells, by which the whole field of operation is visible. The details of the operation should be read in the original. *Goodale.*

Anosmia Caused by Abscess of the Temporal Lobe.

BLOCH AND JULIUS HECHINGER (*Archiv. f. Ohrenheilk.*, Bd. 76, Heft 1 and 2, p. 32) review two published cases of anosmia following abscess in the temporal lobe, and report

one case of their own. In two of the cases the anosmia occurred on the same side as the abscess, but in one of the reviewed cases there was crossed anosmia. In only one case was the presence of the anosmia discovered before the operation; in the other two cases the lack of smell was only determined after the operation, but it seemed most positive that the lack of smell was a consequence of the abscess and not of the operation. *Wood.*

Primary Tumors of the Sinuses of the Nose.

CITELLI (*Archiv. International de Laryngologie,* January, 1908), in connection with his colleague has covered this important subject in a very thorough way. Morgagni was the first to discover such a growth. Since then many anatomists have studied the subject, including Zuckerkandl. It is common to confuse secondary with primary growths which greatly alters the statistics. The author considers the various sinuses in order. He divides the tumors into benign, intermediary and malignant. Of the benign tumors there are the fibroma, soft and hard, the osteofibroma, the lipoma and the angioma. The most common are the soft fibromata. These are usually called mucous polyps. They resemble the nasal polyp but are wont to be single and one-sided. Their origin is obscure, but some irritation or individual predisposition is most probably at the bottom. The other benign neoplasms are rare. Two cases of angiomata and one of lipoma are all that there are on record. In addition to these benign tumors, Citelli makes a class of intermediary tumors. Of these the osteomata are the most common. The cause of them is similar to that of the polyps. While inflammation is undoubtedly the cause in certain cases, it must be remembered that in spite of the great frequency of inflammation in the nose, osteoma is comparatively rare. Enchondroma is exceedingly rare in the antrum. The two most typical cases are those of Heyfelder and Denuce. In all these intermediary tumors it is necessary to distinguish a stage of latency and a stage of manifestation. During the former period the diagnosis is difficult and the symptoms are inclined to be vague. Malignant tumors include endothelioma, sarcoma and carcinoma. Endothelioma is rare but Citelli has collected thirteen cases in the literature, and thinks that others would be

reported if a careful histologic examination were made in every case of antrum growth. Sarcoma is not so common as is generally supposed. The majority of them are secondary, having their origin in the adjoining tissues. All varieties have been observed. Carcinoma is the most frequently met with of all the malignant growths. They spring either from the epithelium or from the glands in the mucosa.

The frontal sinus is much less commonly affected by tumors. Fibroma is very unusual. Osteoma is more often met with. Citelli is of the opinion that fifty cases will represent the total number. They spring usually from the anterior wall, and occur in people from twenty to thirty. As causes, the most probable are a special congenital predisposition and inflammation, especially traumatism. Until the tumor makes itself in evidence by causing tumefaction it is difficult or impossible to make a diagnosis. Finally, malignant growths of the frontal sinus are exceedingly infrequent. Citelli has records of one case of endothelioma, one case of carcinoma and six or eight cases of sarcoma. The sphenoid is still more rarely affected. A few cases of osteoma, one of endothelioma, one of carcinoma, and half dozen cases of sarcoma represent what have been reported. *Harris.*

Foreign Bodies in the Nasal Cavity as a Cause of Maxillary Empyema.

KREBS, Hildesheim (*Archives of Otology,* Vol. xxxvii, Nos. 3 and 4). The author reports two cases, in one of which an infant's rubber nipple had been in a child's nose for at least seven years. In the other case, that of a man aged 33, whose antra were known to be clear, while working a threshing machine a grain of corn flew into the left nostril. One year later a granuloma, to which was attached a grain of corn, was removed from the man's nostril. After two weeks' irrigation the antral suppuration ceased. *Campbell.*

Neuroses of the Nose.

CHARLES P. GRAYSON, Philadelphia (*Medical Record,* December 12, 1908), does not consider that laboratory studies of the secretions of the hay fever sufferer have yielded any results that are genuinely practical. It is of infinitely greater im-

portance to remember and to remove the basic nutritive fault that is accountable for such alterations. *Richards.*

The Submucous Septal Operation.

O. FREER (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) describes the application of his method to different types of septal deviation, and to the numerous abnormalities which may be encountered. The original paper should be consulted for the details. *Goodale.*

Bleeding Polyp of the Septum.

G. TRAUTMAN (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) Clinical and histological reports of 3 cases. *Goodale.*

III.—PHARYNX.

Some Points in the Applied Anatomy of the Tonsil.

HARRY A. BARNES, Boston (*The Boston Medical and Surgical Journal*, Sept. 24, 1908). This is an anatomical study. The capsule of the tonsil may be considered as a highly developed tunica propria of the faucial mucous membrane, separated from its epithelium by the development of the lymphoid nodules which compose the mass of the tonsil. As might be expected from this derivation, it completely invests all parts of the tonsil not covered by epithelium and is continuous with the tunica propria of the faucial mucosa. In microscopic sections it appears as a compact layer of fibrous tissue with numerous elastic and striated muscle fibers interspersed. A number of trabeculae of the same composition, except that muscle fibers are only occasionally found, are given off from its internal surface and extend into the substance of the tonsil between the crypts, and separate it into lobes. Some of the muscle fibers are from the superior constrictor and from the pillars. Blood vessels appear at intervals, the larger of which are seen at the junction of the trabeculae with the main capsule, from which point they supply the tonsil.

The capsule is thin, but tough, not over ½ mm. in thickness, and is quite easily separated from the surrounding tissues at its upper half, but is much more adherent at its inferior half,

and it is at this point that the larger vessels enter the tonsil. Its structure, its toughness, and the ease with which it may be separated from the underlying tissues, make the operation of dissection of the tonsil "in capsule" a very practical one.

Richards.

Results in Adenoid and Tonsil Operations.

J. PAYSON CLARK, Boston (*Boston Medical and Surgical Journal,* Sept. 24, 1908). This is a study made four years after operation of a series of cases operated upon for tonsils and adenoids, which were done in a public hospital. Of 595 cases which he attempted to look up, only 73 could be gotten hold of. In 35 of these cases mouth breathing was said to persist in some proportion. In three cases the mouth breathing was evidently due to obstruction, caused by a deviated septum, and in five others to hypertrophied turbinates. In only one case was there sufficient adenoid present to call for a second operation. In the rest of the cases in which mouth breathing persisted no obstruction could be found to account for it. Twenty-one still continued to snore more or less. Four cases in which enuresis existed were not relieved of this symptom by the operation. Twenty-eight cases were said to still have colds. In 60 of the cases tonsillar tissue was still visible, although in the large majority of the cases the tonsils had been quite thoroughly removed at the original operation. Only ten of the cases had tonsillitis, and of these ten, eight had only one attack. Forty-nine cases had given a definite history of tonsillitis before the operation. In about half of the cases there were remains of adenoid tissue in the vault, but not enough to require reoperation. *Richards.*

Lymphosarcoma of the Tonsil.

J. L. GOODALE, Boston (*Boston Medical and Surgical Journal,* Sept. 24, 1908). Patient was a woman, 35 years of age, with the left tonsil transformed into a firm, reddened mass about the size of a hickory nut, with deep extensive ulceration. The glands on that side below the angle of the jaw were enlarged, firm and tender. A portion of the growth was removed and examined by Dr. J. H. Wright, who reported lymphosarcoma of a rapidly proliferating type. Ether was

given with the object of operating, but the growth had extended to the soft palate, infiltrating it, together with the base of the tongue, so that no operation was performed.

The author having observed in a previous case of Hodgkins' disease that improvement took place after staphylococcus injection, and recognizing the very close relationship between Hodgkins' disease and lymphosarcoma, he determined to utilize this idea in the treatment of the case. Turpentine was therefore injected into the legs with the object of making abscesses. Two minims were first injected without result, except that the sites of injection became rather red and painful. At the same time injections of staphylococcus aureus vaccine were given every three days. The turpentine was increased every two days up to twelve minims at each injection. In about one week the patient began to show improvement and the whole condition was better. Ten days later she was talking easily, while the growth in the throat steadily diminished, and in about one month from the beginning had nearly disappeared. The turpentine injections, which had been borne without great discomfort, became very painful, and she began to have localized necrosis of the skin from the injections. Seven weeks from the time of beginning treatment there was a large stellate cicatrix at the site of the tonsil, and absolutely no sign of new growth, with disappearance of the infiltration at the base of the tongue and soft palate. The lymph nodes on the outside of the neck had become so small that only one about the size of a hickory nut was palpable. Six months from the beginning she was apparently as well as she had even been. On theoretical grounds the author is inclined to attribute the result to the vaccine, since the boils which he expected to excite by the turpentine did not appear until after the growth had nearly disappeared. *Richards.*

Case of Tonsillolith.

JAMES M. ANDERS (*Journal of the American Medical Association,* April 11, 1908). The case is reported by the author because it is unique in some particulars. The patient, a man aged 59 years, had had several attacks of acute articular rheumatism. After his first attack he had suffered from attacks of tonsillitis for many years annually.

For three or four months before seen by the author, he

had some pain and irritation around the right tonsil and in a corresponding part of the neck of the same side. For several weeks the local disturbance became much aggravated. There was great pain in swallowing, but solids could be more easily taken than liquids. His local physician had prescribed flax-seed poultices, and two days after starting to use them the patient became aware of the presence of a hard foreign body which projected into the throat. This caused severe coughing, and with the aid of frantic efforts on the part of the patient, a large mass, of calcareous hardness, was dislodged. There was practically no bleeding after the mass was expelled. An examination made three months after the tonsillolith had been expelled, revealed on palpation with the finger tip, a distinct depression between the palatine arches.

The weight of the tonsillolith is 189 grains, and it measured one and seven-eighths inches in its greatest diameter.

In the vast majority of the cases of tonsillar concretions, they are of medium size and cause no symptoms, but when they attain, as in the author's case, enormous dimensions, they produce irritation and even ulceration of the surrounding tissues.

The author's specimen so far as he has been able to determine is the largest on record.

Jackson reported one weighing 147 grains. The concretions are made up mostly of calcium carbonate and phosphate. They are the result of calcareous degeneration of retained tonsillar secretions. *Theisen.*

Streptococcic Infections of the Pharyngeal Adenoid Tissue in Adults.

ALICE G. BRYANT (*Journal American Medical Association,* June 13, 1908) states that this subject should receive most careful consideration at the hands of the laryngologist.

It is doubtful whether these streptococcic infections of the pharyngeal adenoid tissue in adults are clearly recognized by the general practitioner.

The paper is based upon ten cases in the writer's practice. It is most important to directly examine the post-nasal and nasal regions to settle any debated question where septic conditions are present that cannot be attributed clearly to some one definite region of the body.

The following illustrative case is reported:

Miss A., aged 30 years, had had an attack of influenza

three months before seen by the writer. For two weeks there had been a rise in temperature each evening, ranging from 100.5° F. to 101.5° F., with slight elevation in the morning. She had been examined for pulmonary involvement with negative results.

A cough developed and masses of yellowish white opaque material were freely expelled. On examining the throat, the soft palate, uvula and posterior pillars and pharyngeal walls showed marked swelling and redness. The tonsils were swollen and slightly inflamed. On post-nasal examination the adenoid tissue covered with a creamy secretion was seen. The tissue looked "rat-eaten" and only one-third of it remained, and that was easily removed with the forceps.

Bacteriologic examination showed streptococci in abundance. Constitutional symptoms promptly disappeared after this treatment.

Two other cases are reported.

In none of the writer's cases were the ears involved nor was there any enlargement of the cervical glands.

Theisen.

Pathological Anatomy and Etiology of the Black Hairy Tongue.

H. HAENISH (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reviews the literature, and reports a case of this affection, exhibiting the characteristic hairy deposit.

The patient, a man 66 years of age, had noticed a peculiar sensation for three months on the palate, and fourteen days later discovered a black deposit on the tongue, in association with an acid taste. The hairy growths were removed, and replaced by a circumscribed yellow deposit. Examination of the hairs showed no growths of black fungi when cultivated, but numerous colonies of various cocci. Histologically the hairs were seen to be the hypertrophic and horny papillae filiform. The case is peculiar in showing no recurrence.

Goodale.

Torticollis as Complication of Adenotomy.

L. NEUFELD (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) has observed this condition three times in the last five years. The torticollis appeared in one case two days and in another three days, and in a third five days after the operation. In all in-

stances, the lymph nodes in the neck were enlarged and sensitive. Elevations of temperature were not noted after the first week. The general health of the children was fully established at the end of this time. Passive movements of the head, which at first were very painful, diminished at the end of a week. The head in the first few days was turned backward and sideways, later only sideways. The duration of this manifestation varied from fourteen days to two months. Complete recovery took place in all cases.

Goodale.

. The Pigmentations of the Mucous Membrane of the Mouth.

G. H. ANTHONY (*Journal of the American Medical Association,* November 14, 1908) states that the pigmentations of the mucous membrane of the mouth have not been sufficiently studied.

Congenital pigmentation.—The most common form is the soft mole which may be simply a pigmentation of the skin or may present itself as a mammillated nodule with or without pigmentation or hairy growth.

Oppenheim has reported a case of soft mole affecting the conjunctiva of the eye ball and extending even over the cornea, but the writer could find no cases on record in which soft moles were present in the mucous membrane of the mouth. Even in cases in which the cutaneous surface was studded with pigmentary moles, the mucous membrane of the mouth was free. The author has observed one case of such growth occurring in the mucous membrane of the mouth.

In that case the nodule was situated in the middle line of the roof of the mouth on the hard palate in a woman aged 60 years. There were a few pigmentary moles of the skin also present.

Roy has reported a case of melanosis of the palate which after existing twenty years became sarcomatous.

The pigmentations of xeroderma pigmentosum affect the vermillion border of the lips, but they have not been observed in the mouth. The fibroma molluscum tumors of von Recklinghausen's disease frequently occur in the mouth, but the pigmentations affecting the mucous membrane must be quite rare, because the only mention of them in recent literature is the report of Oddo, who describes them in two cases as well-

defined areas of pigmentation affecting various parts of the mucous membrane and resembling the pigmentations seen in the mouth of dogs.

The pigmentations of the mucous membrane in the mouth in Addison's disease are usually not the same shade of bronze-color as in the skin, but consist of circumscribed areas of melanotic pigmentation. They are rarely absent, and are of great diagnostic importance.

Stelwagon emphasizes the fact that pigmentation is frequently a lesion relic in scleroderma. Audry has reported a case of scleremia, in which ill-defined plaques of pigmentations were present in the mucous membrane of the cheeks.

Phthiriasis.—Thibieige and a number of others have observed melanotic pigmentations of the mucous membrane of the mouth in cachectic subjects with cutaneous brown pigmentation. The fact that such buccal pigmentations occur only in cachectic subjects suggests the thought that hemochromatosis is the cause of such pigmentations rather than pediculi per se.

Osler states that whenever hemochromatosis, either with or without diabetes, is suspected, the correctness of the diagnosis intra vitam will be made much more probable by removal of portions of the pigmented skin and the finding (by the potassium ferrocyanid test) of iron-containing pigment in the cells of the sweat glands, and of the ochre-yellow in the muscle fibres of any blood vessels that may be present, by the use of hemofuchsin.

That pigmentation is actually caused by pediculi is shown by the fact that pediculi pubis cause blue pigmentations of the skin, so that with hemochromatosis excluded, it is extremely probable that pediculi corporis produce brown pigmentations of the skin, and black pigmentation of the mucous membrane of the mouth. In the class of anomalous pigmentations, the author includes all pigmentations of the mucous membrane of the mouth which can not be assigned to any of the preceding disorders.

These pigmentations are almost invariably located in the mucous membrane of the lips. They are usually observed in patients suffering from gastrointestinal autointoxication, diabetes, and neurasthenia. *Theisen.*

IV.—LARYNX.

Clinical Contributions to the Significance of Esophagoscopy and Tracheoscopy in Their Diagnostic and Therapeutic Relation.

E. SCHMIEGELOW (*Archiv. f. Lar. u. Rhin.* Bd. 20, Heft 3) reports a series of cases where the direct inspection of the esophagus, the trachea and the bronchial tubes, was of great value in clinical and therapeutic relation. Cases of cancer of the esophagus, spastic stricture and dilatations came under observation. The writer distinguishes between diffuse and circumscribed dilatations or diverticula. The diffuse dilatations are, as a rule, to be attributed to cicatricial cancerous stenosis, which prevents the food from passing down, and causes it to be heaped up above, with the result of dilating the esophagus. These retention dilatations seldom reach a large size, and may even be absent in spite of the stenosis, as long as the muscular apparatus of the tube above is sufficiently powerful. The dilatation is greatest immediately above the stenosis, and diminishes towards the pharynx.

In addition, there may rarely be found enormous dilatations of the esophagus, without stenosis. These usually assume a spindle form, and may attain the diameter of a man's arm. These dilatations are to be considered as a neurosis with paresis of the esophageal muscles, perhaps in association with spasm of the muscles of the cordia.

The writer reports cases of Zenker's pulsion-diverticulum and of the Rokitansky's traction-diverticulum.

Goodale.

Amputation of Epiglottis in Persons Suffering From Tuberculosis of the Larynx.

MOELLER (*Revue Hebdomadaire de Laryngologie, D'Otologie,* April 18th, 1908). While removal of the epiglottis has occasionally been done in whole or part for extensive disease, Hajek was the first, in 1893, to do a complete operation on a consumptive suffering from dyspnea. Moritz Schmidt has performed it in nine cases, in three of whom there was a perfect cure. The author has performed the operation ten times, and recommends as the best instrument to perform it, the guillotine devised by Alexander, with which he claims it can be easily performed. He has never seen any severe con-

sequences from the operation. If one does not touch anything but the middle of the epiglottis, there is no considerable bleeding. There is some sore throat for a few days. In three of the ten times thus operated upon, a cure was effected. Two of the cases died later, one of cerebral tuberculosis. He did not have any dysphagia after the operation. The other died from the pulmonary disease. Two cases are still under treatment, and in four an accurate report can not be made. In three cases suffering from dysphagia there was entire relief. In the author's opinion, the indications for the operation are first, a tubercular lesion, situated in the free part of the epiglottis, alone, provided the patient's condition is such as to permit of this slight intervention; second, a pronounced dysphagia in a case of laryngeal tuberculosis without regard to the condition of the rest of the larynx and the lungs, provided that the dysphagia is caused by a lesion of the epiglottis; third, a severe tubercular affection of the epiglottis, even without dysphagia in a case of laryngeal tuberculosis, provided that there is no pulmonary disease or the condition of the lungs is such that one can hope for a complete recovery or a considerable improvement. In these cases the removal of the epiglottis makes the treatment of the disease in the interior of the larynx easier, so that one may hope for a complete cure. *Harris.*

The Phonation Center in the Cortex of the Dog.

J. KATZENSTEIN (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3). The origin of voice production in the dog may be conceived as follows: The anterior central gyrus, the precentral gyrus, the anterior gyrus compositus, i. e., the parts of the cerebrum from which proceed the movements of the abdominal muscles, the diaphragm, the thorax, the larynx, the pharynx, the tongue, the lips and the jaw form the lower or primary center for the component muscles of voice production. At a definite point of the above-mentioned cortical field, namely the anterior central gyrus, which is at the same time the center of cortical respiration, lies the center of a higher order for voice production, from which the whole act of voice is voluntarily produced. We find therefore, the primary lower centers of voice production, i. e., centers of perception for the movements of the abnormal muscles, the diaphragm, the

thorax, larynx, pharynx, palate, tongue and lips, and the jaw in the above-mentioned centers of the anterior central gyrus, the precentral gyrus and the anterior gyrus compositus; on the other hand, the center for the production of the whole act of voice production, in which the above-mentioned portions of the vocal act unite in common with the respiratory center at a place in the total cortical field for voice production, is found in the anterior central gyrus. The production of voice proceeds therefore from the observations which the animal makes in the first period of his life during the act of expiration, and the simultaneous expiratory movement of the vocal cords. In the first weeks of life young dogs do not bark, they whine, whimper and cry, according to the sensations of pain or pleasure which they feel. After about six weeks, probably involuntarily, an expiratory act gives rise to a bark, and the animal seizes upon this act as a means of expressing later his sensations of pleasure and pain. *Goodale.*

A Report of Three Cases of Laryngeal Growth Removed by Direct Laryngoscopy.

JOHN MCCOY, New York (*American Journal of Surgery*, September, 1908). The first case was a fibroma of the inner surface of the left cord, failure having resulted on every attempt to remove the growth by the indirect method. A hypodermic injection of 1/4 grain of morphia and chloroform anesthesia were administered. The growth was readily seen, but there was such excessive bronchorrhea and difficulty from the narcosis that a hypodermic injection of atropia gr. 1/100 had to be given. The separable speculum of Dr. Jackson was used. The growth was completely removed and the patient's voice quite restored.

In Case 2 there was a growth in the interarytenoid region, which proved to be hypertrophic tuberculosis. Morphia, atropia, cocain, chloroform anesthesia was used. The growth was pale in color and papillary in appearance, extending from just below the cords to the upper limit of the larynx. It was removed piece by piece with the straight forceps. The difficulties encountered in this case were, that the patient seemed to come out from deep anesthesia and struggle, which necessitated some delay in getting him well under again. Also, he did not seem

to bear the combination of chloroform and cocain very well, as the pulse was more rapid and weak than it should have been.

Case 3 was a chronic inflammatory thickening at the base of the left arytenoid, and was removed without particular difficulty.

The author thinks that the combination of morphin and atropin seems to control any tendency to excessive bronchial secretion. *Richards.*

Laryngeal Crises and Paresis of the Abductors of the Vocal Cords as Important Early Symptoms of Tabes.

OTTO T. FREER, Chicago (*Journal A. M. A.*, Sept. 5, 1908). "The laryngeal paralyses found in tabes, though often the first and possibly the only paralytic symptoms to occur, are but a portion of a group of paralyses found as results of pathologic degenerative changes in the cranial nerves or their medullary origin. Thus paralyses of the ocular muscles, the levator palati, the trapezius or sternomastoid muscles may be found. Indeed, the paralyses due to cranial nerve involvement in tabes may be so numerous and extensive that bulbar paralysis is simulated.

"The degenerative changes found in the laryngeal paralyses of tabes may be found in the nucleus of the vago-accessorius nerve, or in the intrabulbar root fibers of the vagus and accessorius, or in their peripheral extensions. The degeneration may also be limited to the vagus trunk or that of the recurrens, the medullary portions of the nerves being intact."

A case is reported in detail, illustrating the laryngeal paralyses of tabes. *Richards.*

Primary Lupus of the Larynx.

A. ROSENBERG (*Arch. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reports two cases of this affection, with special reference to differential diagnosis. Papilloma is readily excluded, being a rose-colored, cauliflower-like, often pedunculated growth, movable with the probe, and almost never being situated on the epiglottis. Syphilis in the stage of infiltration or ulceration is readily separable, exhibiting more congestion, and appearing moister, more shining and at times edematous, while the development is more rapid, and leads to marked thickening of the epiglottis. Syphilitic ulcerations are more sharply

bordered and deeper, the surrounding tissue is more congested, brighter red and moister. If the lupus process has gone to cicatrization, it may be confused with syphilitic scars, although these latter usually show more a fibrous, dense and white appearance, and also extend into the depths. A special characteristic of lupus is the presence of the three stages of infiltration ulceration and cicatrization, especially the formation of brownish-red nodules in the scars.

In distinction from tuberculosis, it is first to be noted that lupus always attacks the epiglottis, and exhibits a granular or irregular surface of a moderately red color, with an increase in thickness greatly exceeding that present in tuberculosis. The aryepiglotic folds in lupus exhibit more symmetrical thickening, not translucent, but denser and slightly irregular, while finally lupus excites no pain or discomfort.

Goodale.

Pharyngeal and Laryngeal Syphilis.

T. HERYNG (*Wiener medicinische Wochenschrift*, Nos. 44 and 45, 1908). Syphilitic angina may be recognized by a diffuse (more rarely localized), dark red or bluish-red color of the mucous membrane of the pharynx. The typical patches are seen most frequently on the tonsils, the uvula and the anterior faucial pillars. They at first have the appearance of a thin white deposit which can be better seen with natural light. As the process develops, irregular losses of tissue occur on the pillars and tonsils. Although these patches have a characteristic appearance, they are sometimes treated for chronic diphtheria and follicular tonsillitis.

A beginning pharyngeal lues is also commonly diagnosed as herpes, stomatitis, and pharyngo-mycosis.

A localization that is not always recognized is the lateral luetic pharyngitis. In the cases observed by the author lateral yellowish-red elevated patches, with swelling of the posterior pillars of the fauces were present. Small nodules develop on these elevated areas, and when thy break down, small ulcers, funnel shaped depressions, from 2-3 mm. deep, develop. In from 8 to 15 days these ulcers heal, leaving a smooth cicaricial surface. The pharyngeal syphiloma occurs either on the uvula, at times on its posterior surface, but more frequently on the posterior pharyngeal wall. It is either soli-

tary or multiple. At first this takes the form of an either diffuse or nodular waxy infiltration which soon takes on a yellowish color and results in an ulcer with sharply defined edges.

This ulcerative process often extends to the tonsils and pillars, cicatrizing in one place and breaking out in another and may last for months.

The gummi of the velum results in perforations which sometimes develop very rapidly. A fistula communicating with the naso-pharynx develops in the middle of the infiltrated area. These perforating ulcers occur also on the hard palate, and result in necrosis of the bone. Ulcers involving the uvula often result in adhesions between the soft palate and posterior pharyngeal. wall Ulcerative processes involving the pharynx at times develop very insidiously without producing much pain and difficulty in swallowing.

In considering laryngeal syphilis the author states that the symptoms in the majority of the cases come on with disease of other organs, i. e., skin lesions, and involvement of the bones or glands.

The typical papule, the broad, gray condyloma, develops most frequently on the edge of the epiglottis, then the cords, the posterior wall of the larynx and the aryepiglottic ligaments in the order named.

The location and development of the tertiary infiltrations varies very much. They usually occur in from three to eight years after the primary lesion. Syphilitic corditis is usually unilateral, while corditis inferior is more frequently bilateral. Syphilitic laryngeal tumors, which at times are very large, may simulate malignant growths. The symptoms of secondary syphilis of the larynx are usually hoarseness, with a good deal of irritation and cough. Dangerous symptoms are caused by the breaking down of the specific infiltration and the formation of cicatrices and stenoses.

Considering the differential diagnosis the author states that the greatest difficulty is presented by the combination of syphilis and tuberculosis which frequently simulate carcinoma.

Syphilitic ulcers have certain characteristics, the sharply defined edges, the grayish base, the greatly reddened infiltrated surrounding tissue, which distinguish them from other ulcerative processes. The surest diagnostic evidence is however the rapid improvement when proper treatment is started.

Gummata rarely occur in the muscles of the larynx, although cases have been reported by Eisenberg, Turck and Mackenzie.

Syphilitic perichondritis attacks the cricoid cartilage most frequently, more rarely the arytenoid.

The edema that sometimes accompanies perichondritis may cause alarming symptoms, and patients with this condition should be carefully watched.

Treatment: The author recommends inunctions and intramuscular injections. In using inunctions he states that the nearer the seat of the lesion the applications can be made the more effective they will be. Intra-muscular injections are particularly recomended when a rapid course of the disease is feared, or when dangerous complications such as brain syphilis and destructions of important organs occur.

Schwinner's sozoidol of mercury is the best for intramuscular injections. The formula is Hydr. sozoidolic, 2.0-4.0 Kal. iod. 3.0-6.0, Aq. destill. steril. 5-0.

In considering the use of iodide of potash he mentions the fact that laryngeal edema may be produced, and for this reason it should be used with the greatest care in patients with kidney or heart trouble. *Theisen.*

Needle in the Left Bronchus.

SCHROTTER (*Deutsche medicinische Wochenschrift*, April 9, 1908) has operated upon 10 cases of foreign bodies in the trachea and bronchi, and reports another case of an unusually long needle in the bronchus of a 12-year-old child.

While the child was holding a shawl pin in the mouth a sudden paroxysm of coughing followed by a deep inspiration carried it into the air passages. This was followed by a severe paroxysm of coughing and cyanosis. The coughing continued during the day, but the child did not complain of any pain in the chest and slept nearly all night. Between the paroxysms of coughing which came on during the next few days, the child felt perfectly well. The child was sent to the hospital and an X-Ray examination made. The radiograph showed the presence of the pin in the left main bronchus, the head of the pin being down.

The operation was performed without general anesthesia, with the child in the sitting position. A tube with a diameter

of 8.5 mm. and 22 cm. long, was easily passed into the trachea under the guidance of the finger.

The point of the pin could be seen projecting from the left bronchus into the trachea.

After two attempts the pin was successfully removed on the twenty-first day after it was aspirated. The operation was not followed by any reaction at all, and the child was able to leave the hospital on the third day. *Theisen.*

Observations on Diffuse Pachydermia Laryngis.

W. ALBRECHT (*Archiv. f. Lar. u. Rhin.*, Bd. 20, Heft 3) reports a case characterized by the formation of white, chalky masses, situated upon the vocal cords, consisting of a horny epithelium, in association with inflammatory reddening of the vocal cords. The author compares the manifestations present in his case with those reported by other observers. In spite of their clinical differences, all belong etiologically and pathologically to the same category. *Goodale.*

Tracheobronchoscopy for the Removal of Foreign Bodies.

C. JACKSON (*Archiv. f. Lar. u. Rhin.* Bd. 20, Heft 3) describes his well-known apparatus, and its application in several cases. A number of observations of interest are made, among others the necessity of wearing glasses to avoid the danger of secretions from the bronchial tubes striking the eye. Even if the secretions are not likely to produce infection of the operator, yet it is important to prevent the possibility that cocain may be coughed up and interfere with the vision. *Goodale.*

BOOK REVIEWS.

Bier's Hyperemic Treatment in Surgery, Medicine and all the Specialties: A Manual of Its Practical Application.

By Willy Meyer, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; and Professor Dr. Victor Schmieden, Assistant to Professor Bier at Berlin University, Germany. Octavo of 209 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1908. Cloth, $3.00 net.

This volume is not a translation of Prof. Bier's work on hyperemia, but is rather a brochure detailing the principles, methods of inducing, and results of using hyperemic treatment, and was written in order to furnish those that cannot read German an authoritative English version of the work of Prof. Bier. The section devoted to rhinology, pharyngology, laryngology, discusses acute coryza, frontal and maxillary sinusitis, tonsillitis, catarrh of the upper air passages, hay-fever, chronic angina and tuberculosis of the larynx. The suction apparatuses for the nose and for the tonsils are illustrated by clear cuts. The book is well gotten up, the illustrations being especially commendable.

The Surgery of the Ear.

By Samuel J. Kopetzky, M. D., Attending Otologist, New York City Children's Hospital and Schools; Attending Otologist to the New York Red Cross Hospital; Assistant Surgeon and Instructor in Operative Surgery of the Ear, Manhattan Eye, Ear and Throat Hospital; Pathologist and Surgeon, New York Throat, Nose and Lung Hospital; Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the New York Academy of Medicine, American Medical Association, Otological Society of Germany, etc. Illustrated with 63 Half-Tone and Line Drawings, 8 Charts and 4 Colored Plates. Rebman Co., New York. Price, $4.00.

Although at present there is no lack of good text books on otology either in the English or most foreign languages, the work of Kopetzky's will be a welcome addition to the library of every specialist as well as many general practitioners who seek information regarding the operative procedures connected with the ear. That the reviewer does not always coincide with the opinions expressed by the author is natural in a branch so comparatively young as ear surgery. Yet every

reader of the book will acknowledge the zeal and the large experience of the author. Space does not permit the review of every chapter, much as it might be desired.

The author in describing the "simple mastoid operation," is not in favor of the so-called "blood clot" method, as his results were not good. Most of us will agree with him that this question is still sub judice.

The account of mastoid operations on the infant and young child is very valuable, as Kopetzky's special experience in this particular is evident. The difference in the sections through the ears of the child and adult on plate 7 would have been still more striking, if cuts from the same side would have been made. This chapter, however, is one of the best in the book.

The thorough description of the anatomy of the different parts is often a tiresome task for the reader, but we are glad to state that Kopetzky has succeeded in making those parts easily readable. "A thorough knowledge of the anatomy of the parts and their inter-relations is conducive to thoroughness" is an expression carried out with fidelity. The references to the figures all through the book would have been of greater service if the number of the page on which it is found would have been stated. Some of the drawings are very good, but more colored plates would have been desirable. The book may be read advantageously by every practitioner interested in the subject. *W. F.*

Diseases of the Nose, Throat and Ear, Medical and Surgical.

By William Lincoln Ballenger, M. D., Professor of Otology, Rhinology and Laryngology, College of Physicians and Surgeons, Department of Medicine, University of Illinois; Fellow of the American Laryngological Association; Fellow of the American Laryngological, Rhinological and Otological Society, etc. Illustrated with 471 engravings and 16 plates. Lea and Febiger, Philadelphia and New York, 1908.

Modernity is the key note of Ballenger's treatise, if indeed it is not futurity. For he has evidently striven to give the newest developments, even if they have not been subjected to the searchlight of experience. Differing from most textbooks which are old before they are issued, this one at least has the merit of being new. While the author may be required to change some of his claims in future editions, this is no more than is done by those who write the more or less

dull, more or less prosy, more or less conservative text-books which are so common nowadays.

There is also a sense of satisfaction which is experienced by one who studies the illustrations which are in the main original and which show what they are intended to bring out.

The descriptions of operations, especially those most recently devised, are worthy of commendation. Ballenger has the power of making clear even the most technical details of operative procedure ordinarily so difficult of understanding.

The letterpress is good, the type clear, the paper of good color and quality, in fact, taking the book as a whole it is most satisfactory. Some few typographical and grammatical oversights will doubtless be corrected in subsequent editions.

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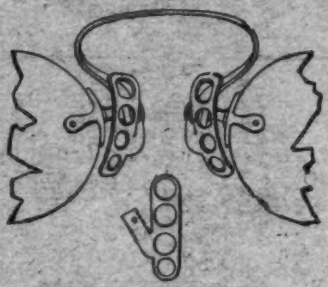

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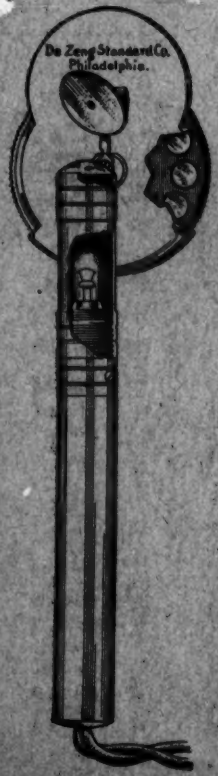

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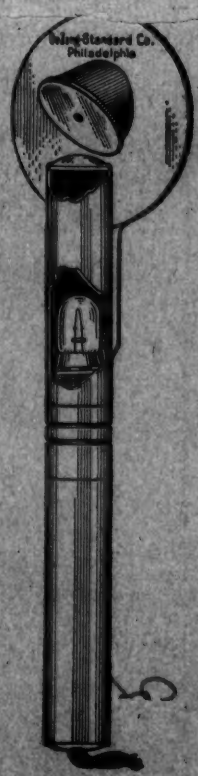

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